ISCDP is the first HLA registry in the East Mediterranean and it is located in the Hematology – Oncology and Stem Cell Transplantation Research Centre, it works under supervision of Tehran University of Medical Science.ISCDP has established since 2008 and listed under Bone Marrow Donor World Wide Since 2010.

Since ISCDP is a small registry with limited Donors database because of some problem in budget, But it is working under WMDA standards and has been able to run a search nationally and internationally for patients in need of HSCT.

ISCDP include 2 departments:

1. Registry
2. HLA Lab

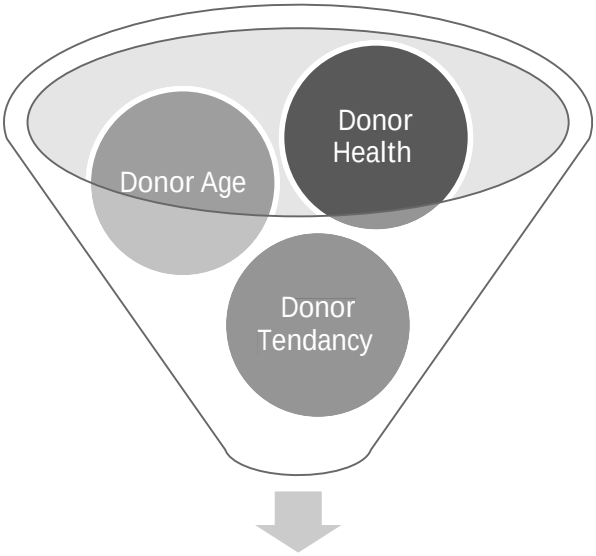
Registry is divided into 2 sub departments:

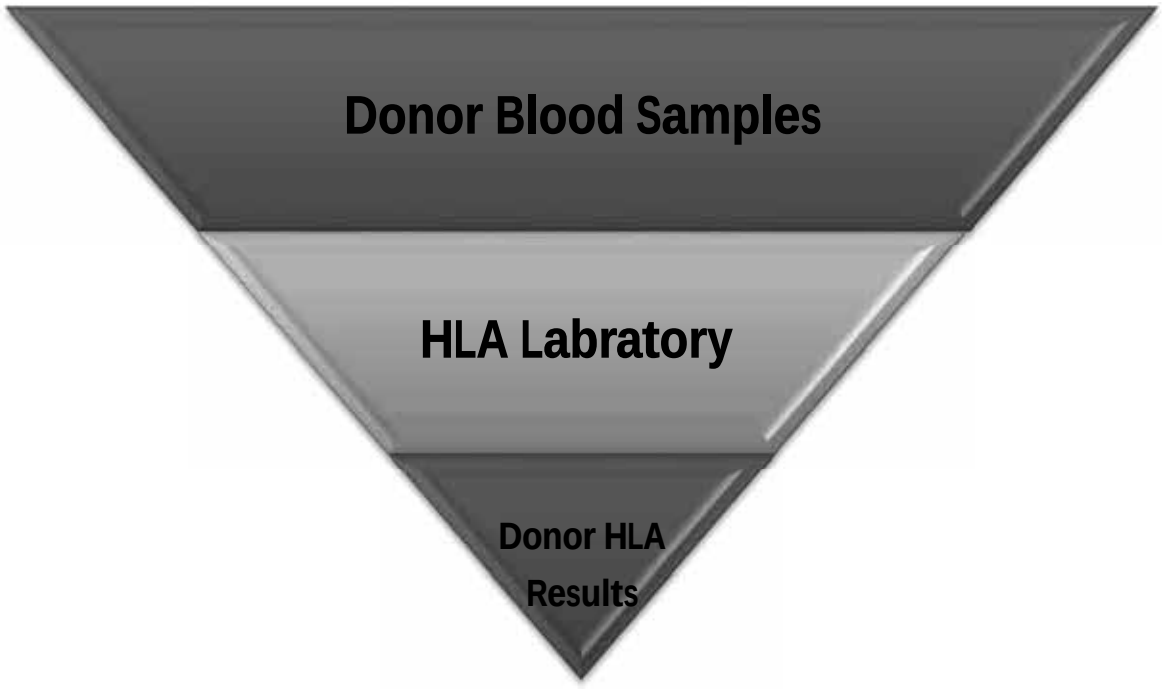
a.Donor Department

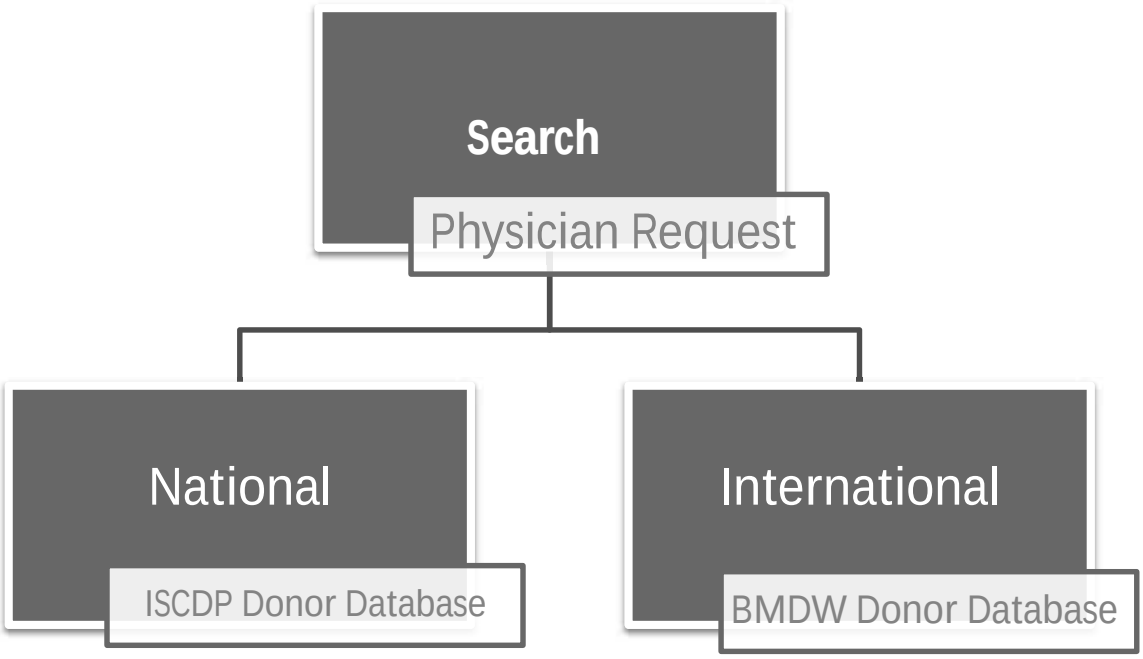
b. Patient Department

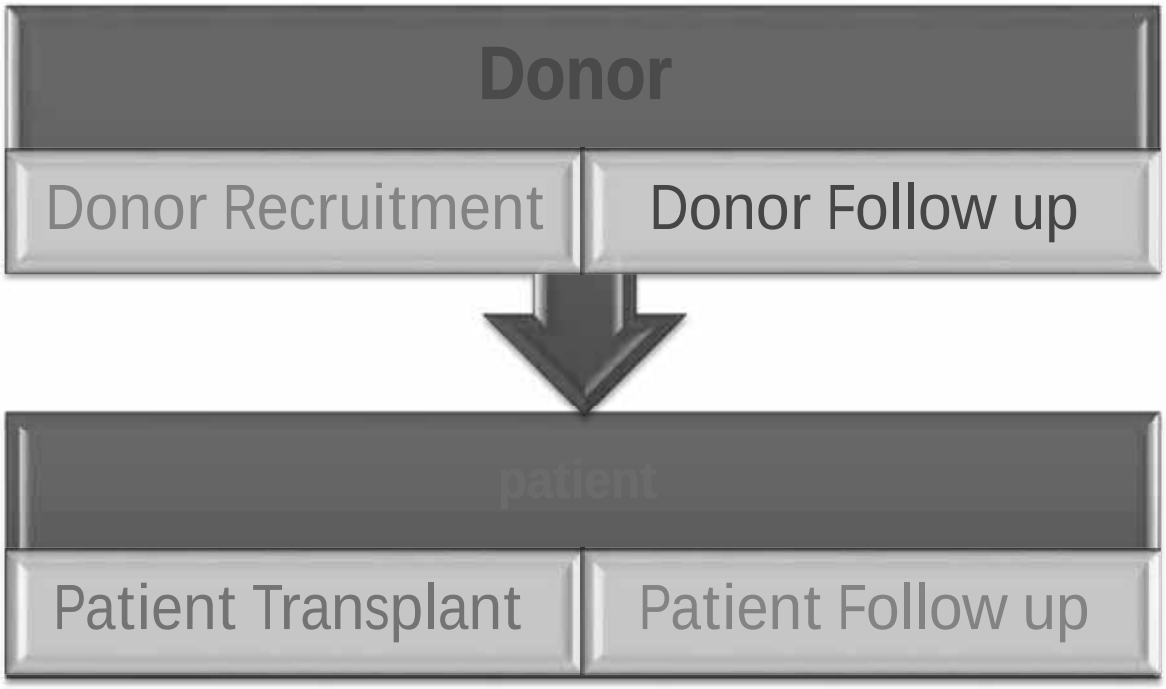
HLA Laboratory

In consequence blood samples are transferred to HLA typing lab of ISCDP for defining HLA A, B and DRB1 of volunteers. DNA extraction is performed either manually (salting out) or automatically (automated DNA extraction [ZINEX]) and HLA typing is done by SSP (sequence specific primer) or SSO (sequence specific oligonucleotide) techniques. Results after vigorous analysis are reported in low resolution form are delivered to registry department.




Donor Blood Samples
HLA Labratory
Donor HLA
Results


Search
Physician Request
National
ISCDP Donor Database
International
BMDW Donor Database



Future Prospective Plan

- ✓ More Recruited Donor
- ✓ More HLA-Typing Database
- ✓ Boost Registry Software

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In the Name of God

The 3rd International and 6th National Congress on Hematopoietic Stem Cell Transplantation

The 1st Regenerative Medicine Congress

Joint with the 4th Biennial EMBMT Congress and

The 1st Annual Nursing Congress

January 14-16, 2016 | Tehran , Iran

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Words of Welcome

We are delighted to welcome you to the congress of the Stem Cell Transplantation in Tehran, Iran, 2016.

The Iranian Stem Cell Transplantation (ISCT) is a relatively old organization, representing the interests of the patients and transplant clinicians treating solid tumors, hematologic malignancies and other disorders (genetics, immunodeficiencies) by blood, marrow and cord blood in Iran and the Persian Gulf Region. In addition, we provide regenerative medicine therapies to patients suffering from a variety of illnesses.

The Iranian Stem Cell Transplantation (ISCT) is one of the founding member societies of the Eastern Mediterranean Blood and Marrow Transplantation (EMBMT) group for blood and marrow transplantation. Moreover, ISCT is an executive board member of APBMT and active member of APBMT, EBMT and ASBMT.

The annual congress is a scientific meeting, enabling clinicians and other professionals with an interest in cord blood and marrow transplantation to present their data, exchange information and attend the state-of-the-art educational symposium. We often have annual events in conjunction with local hematology-oncology scientists during scientific meetings.

The scientific program includes topics on major advances in recent years, presentations on establishing new transplant programs and keeps in view the needs of the region, particularly Iran.

Tehran is the largest city of Iran which sets the cultural and economic pace for the country. With its very rich history, we believe that you will be able to combine work and education with pleasure of exploring a new interesting culture in Tehran and other cities of Iran.

Finally, we are excited about this meeting as well as the opportunities for scientific and social interactions with colleagues from the region and around the world.

Prof. Ardeshir Ghavamzadeh

President of the Congress

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Medical Oral Presentations

Transplant for CLL

Mazyar Shadman, MD, MPH

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Allogeneic stem cell transplant (allo-SCT) is the only potentially curative treatment for chronic lymphocytic leukemia (CLL)/ Small lymphocytic lymphoma (SLL). Allo-SCT has been the historical treatment of choice for CLL/SLL patients with high-risk molecular features like del 17p and/or mutated TP53 gene, ones with fludarabine-refractory disease as well as patients with early relapse. However, with the recent introduction of B-cell receptor (BCR) modulators like ibrutinib (a bruton tyrosine kinase inhibitor) and idelalisib (PI3 Kinases inhibitor – delta isoform) treatment outcomes have significantly improved compared to the historical observed outcomes from conventional chemoimmunotherapy. Both ibrutinib and idelalisib produce Long-term progression-free survival (PFS) and overall survival (OS) in patients with relapsed/refractory disease and are associates with minimal toxicity. Therefore, role of allo-SCT for these patients has become questionable considering the significant transplant-related complications. Despite these promising results, patients with del 17p still experience early relapse (median of ~30 months) even on ibrutinib. More importantly outcomes are extremely poor after ibrutinib failure with overall survivals reported in few months. For this reason, transplant remains a major treatment modality for patients with high cytogenetic risk. The challenge remains to be the careful selection of patients for transplant and more importantly the optimal time for such referral. The paradigm is becoming more complicated with other effective agents in the pipeline including other novel agents including venetoclax (a BCL-2 antagonist) or acalabrutinib (second generation BTK inhibitor) among others as well as immunotherapy approaches like chimeric antigen receptor (CAR-T) cell treatment. Collaborative research is required to identify high-risk patients, to predict the timing of failure of BCR targeting agents and to develop strategies to decrease the transplant-related complications. Ideally, efficacy and toxicity of CAR-T cell therapy need to be compared to allo-SCT in a randomized control setting.

Transplant for MDS

Mazyar Shadman, MD, MPH

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Allogeneic stem cell transplant is the only curative treatment for myelodysplastic syndrome (MDS) and long- term (30-40%) survival rates are reported even in patients with high-risk disease. However, only a small percentage of MDS patients undergo allo-SCT, which may be at least in part related to the age of diagnosis (70s) and related comorbidities. Common MDS classification systems like IPSS-R or WPSS can be used to predict disease aggressiveness and likelihood of survival in the absence of transplant. In addition, recent data indicates prognostic significance of mutational markers and therefore integration of molecular markers to the standard scoring systems in expected in near future. The other important consideration is transplant-related toxicity including graft-versus-host disease (GVHD). Sorror HCT comorbidity index (HCT-CI) is a strong predictor of non-relapse mortality and has recently been shown to also independently predict the risk of GVHD. Overall, the key is to have good understanding of risk to benefit ratio in each individual patient. Optimal debulking before HCT is critical and ongoing studies at our center currently explore the role of chemotherapy compared to hypomethylating agents in high-risk MDS patients (> 10% blast) for this purpose. The transplant outcomes can further improve by using more effective conditioning regimens. For example strategies like Treosulfan based regimens or radioimmunotherapy and are currently under investigation. Like other hematologic malignancies, strategies to preserve graft-versus-leukemia effect while decreasing the GVHD risk is critical.

HLA and non-HLA criteria to select between equally matched or mismatched unrelated donors.

Carlheinz Mueller

ZKRD – Zentrales Knochenmarkspender-Register Deutschland (German Stem Cell Donor Registry), Ulm

It has long been known that HLA identity is a key prerequisite for a successful transplantation of hematopoietic stem cells from an unrelated donor, however only the introduction of DNA based typing methods made it possible to reliably determine HLA identity outside the core family. Since the millennium numerous studies (Flomenberg, Lee, Woolfrey, Fürst) have been undertaken to investigate which HLA loci are relevant for the selection of unrelated donors and if matching should be evaluated on the allele or the antigen level. There is now a broad consensus that HLA-A,-B,-C and -DRB1 are critically important and that an HLA difference at one of these loci reduces the overall survival at 5 years by about ten percentage points. There is no clear evidence that allele level differences are better tolerated than antigen mismatches (except, perhaps, for HLA-C). The role of HLA-DQB1 is still debated and will remain difficult due to the tight linkage of HLA-DRB1 and -DQB1. In recent years, the relevance of HLA-DPB1 in the ranking of otherwise equally matched donors has been established (Fleischhauer, Shaw, Pidala) including a concept of permissible mismatches for this locus.

A substantial fraction of patients, in particular of Caucasian origin, have substantial number of equally matched or mismatched donors and then the question arises which one to choose. Most studies have not just compared match versus mismatch but could also demonstrate the relevance of single mismatches at every locus and determine their individual risk relative to a matched donor. However no study was able to demonstrate that a difference at one of those loci is less or more tolerable than another one and there is not even a clear trend of the hazard ratios shown. There is good evidence that younger donors lead to a significant survival advantage (e.g. Kollman). There is some indication that (additional) multiple mismatches at low expression loci (DP, DQ, and DRB3/4/5) have a negative impact (Fernández-Viña). It is quite common practice to prefer a gender identical donor for non-malignant diseases and a male donor otherwise and also to prefer donor with a matched CMV sero-status but this strategy is not supported by large recent studies. The debate about the relevance of ABO matching is still going on and in spite of intensive research we still do not have reasonable evidence on how the KIR polymorphism should be incorporated in the selection of unrelated donors.

In the end it is most important to rank observed donor characteristics in the decision process according to their current base of evidence.

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Workshop: The Organisation of an Unrelated Donor Registry

Carlheinz Mueller

ZKRD – Zentrales Knochenmarkspender-Register Deutschland (German Stem Cell Donor Registry), Ulm

In view of the overwhelming polymorphism of the HLA at a global and even regional level large numbers of donors are required to find suitable matches for the majority of the patients. Building up and managing a large and efficient registry poses numerous challenges. Time permitting, this workshop will address many of them like e. g.

- The overall structure: A single comprehensive organisation or separate entities cooperating with a central registry.
- Necessary size of a registry.
- HLA typing strategies.
- Financing a registry.
- Donor Management: Recruitment and retention.
- Necessary services and fee structure.
- WMDA Standards, national standards and quality management.
- WMDA membership, qualification and accreditation.
- Donor Work-Up and transplant organisation.

Recommended reading:
A gift for life – WMDA handbook for stem cell donation. ISBN 978-90-821221-0-7

Partow Kebriaie, MB

Treatment strategies in patient with recurrent acute leukemia after allogeneic hematopoietic stem cell transplantation

Patients who relapse after allogeneic hematopoietic stem cell transplantation (SCT) have a limited prognosis. Chemotherapy followed by donor lymphocyte infusion (DLI) or second SCT have been used with varying success. Long-term survival is determined not only by the high risk for relapse but the resulting high rate of treatment-related mortality (TRM) sustained by patients requiring extensive therapy. Thus, generally, younger patients have less TRM and fare better. In all cases, a second remission is required before proceeding to DLI or second SCT. In this talk, I will review the published outcomes for patients with leukemia receiving DLI or second SCT following relapse after first SCT, in efforts to determine which, if any, approach may be more superior.

Is there a role for maintenance chemotherapy in patients with Philadelphia chromosome positive ALL and other high-risk subtypes?

The prognosis for patients with acute lymphoblastic leukemia (ALL) who relapse after hematopoietic stem cell transplant (SCT) is very limited. Low success in achieving a second remission and high rates of treatment-related mortality (TRM) preclude long-term remission after relapse. Thus, efforts continue to prevent relapse in the form of maintenance therapy after transplant. The development of highly effective, targeted, oral chemotherapy has greatly facilitated this approach. For example, the use of lenalidomide maintenance therapy following autologous SCT for multiple myeloma has significantly improved progression-free survival (PFS) for these patients. However, the data for maintenance therapy in ALL is less clear. In the only prospective, randomized study of the tyrosine kinase inhibitor (TKI) imatinib administered either as pre-emptive therapy vs. in response to positive minimal residual disease (MRD) following allogeneic SCT for Ph+ ALL, the authors noted an increase in the time to molecular relapse for the approximately 1/3 of patients who were able to take imatinib for a sustained period post SCT, but did not find an improvement in PFS or overall survival for pre-emptive vs. MRD-triggered imatinib.[1] However, the use of TKI following SCT for Ph+ ALL patients has become standard of care in many countries with varying recommendations on the duration of therapy post SCT. The long awaited US intergroup study (SWOG-BMTCTN 0805) of hyperCVAD plus dasatinib followed by SCT for patients with donors followed by maintenance with dasatinib for all patients has been completed, and the results will be reported at this year's American Society of Hematology meeting. In this talk, I will review the published data for maintenance therapy following SCT in ALL, and review upcoming maintenance strategies with novel agents such as the bi-specific antibody T-cell engager blinatumomab, and our experience at MD Anderson using donor-derived chimeric antigen receptor (CAR) modified T cells post SCT.

Reference:

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Haplo-identical stem cell transplantation: The MD Anderson experience

Haplo-identical stem cell transplantation (SCT) is providing opportunities for transplant in patients in whom SCT was previously not an option due to lack of suitable HLA donors. Furthermore, in contrast to the other alternative donor graft, cord blood, haplo donors are found in nearly every family, and thus, donor banks are not needed. Haplo-identical SCT was previously accomplished using ex vivo methods to either deplete CD3 cells or select CD34 cells. Either approach was typically associated with high rates of graft failure and overall high treatment-related mortality (TRM). The more recent approach, pioneered by Fuchs and Luznik and colleagues at Johns Hopkins University, of in vivo T cell depletion with the administration of cyclophosphamide after stem cell infusion, has revolutionized haplo-identical SCT with significantly lower TRM and better overall results. In this talk we will review the outcomes for haplo-identical SCT, with an emphasis on our conditioning regimens and outcomes for haplo-identical SCT at MD Anderson Cancer Center.

Chronic Graft-versus-Host Disease – Pathophysiology, Risk Factors and Treatment

Hans-Jochem Kolb, Ernst Holler, Belinda Simoes, Andreas Hausmann, Mareike Verbeek

Clin Cooperative Group Hematopoietic Cell Transplantation, Helmholtz Zentrum Muenchen, Med. Klinik III, Universitaet Muenchen, Med. Klinik, Universitaet Regensburg, Germany, Faculdade de Medicina Ribeirao Preto, Universidade Sao Paulo, Brazil, Klinikum Muenchen Schwabing, Med. Klinik III, Techn. Universitaet Muenchen, Germany.

Chronic Graft-versus-Host Disease (cGVHD) is an increasing daily problem for transplant centers because of an increasing number of patients surviving allogeneic transplantation. The symptoms may range from dry eyes to generalized exanthema with sclerodermatous lesions, mucositis, obstructive lung disease, liver and gut alterations. There have been many efforts to categorize severity from the original limited and extended towards a more detailed classification according to NIH consensus meetings. The differentiation into acute and chronic according to the time point of 100 days has been changed toward overlap syndromes as late acute and progressive. However, much of the pathophysiology is still unknown. Clinical presentation often resembles autoimmune disease and the hypothesis has been put forward that cGVHD is an autoimmune disease as a result of incomplete and disturbed immune restitution. Immunological characteristics are predominance of CD4 T helper 2 cells instead of TH1 and more cytokines like IL-4 and Il-5 instead of IFN-g and TNF-a. Most suspicious is the occurrence of eosinophilia in the peripheral blood. Hypergammaglobulinemia may be result of B cell simulation, but hypogammaglobulinemia may also be observed. Risk factors are previous acute GVHD, older age of the patient, blood stem cells instead of bone marrow, HLA disparities, conditioning treatment and female multiparous donors for male recipients. Patients with thrombocytopenia, lung and liver involvement,. progressive form and overlap syndrome have a poor prognosis. Survival is deteriorated particularly in patients with lung involvement and recurrent infections. Strong support for the allogeneic immune reaction instead of autoimmune comes from transplants of split donor skin grafts to patients with skin ulcers; these show normal texture and hair growth in contrast to the patients skin. Treatment is based on the use of corticosteroids; several randomized studies of steroids and combinations of steroids and immunsuppressive drugs have not shown improved survival with the combinations. Non-randomized studies have suggested a steroid sparing effect of the combination with photophoresis with psoralen and extracorporeal UV irradiation of the blood (ECP) as well as the combination with cyclosporine or tacrolimus. Our preferred treatment is the combination of steroids with ECP and/or sirolimus, because both allow sparing of steroids and allow induction of transplantation tolerance. One of the unresolved questions is the role of infections in cGVHD; cGVHD itself as well as as its treatment is highly immunosuppressive and may enhance infections. Cytomegalovirus infection and other viruses such as varicella zoster promote the development of cGVHD, preemptive treatment may decrease the incidence and severity of cGVHD. Other infections like helicobacter pylori may decrease the in cadence and severity of GVHD. Norovirus infections can predispose to severe gastroenteritis and produce severe GVHD. Many factors of cGVHD are unknown, but the best approach may be preventing by antithymocyte globulin treatment prior to transplantation and support of rapid immune restitution.

The role of minor histocompatibility antigens in allogeneic stem cell transplantation.

Hans-Jochem Kolb, Dagmar Bund, Antonio Gallo, Ingeborg Laaser, Raymund Buhmann, Jerzy Adamski, Anne Dickinson; Clin Cooperative Group Hematopoietic Cell Transplantation, Helmholtz Zentrum Muenchen, Med. Klinik III, Universitaet Muenchen

Newcastle University

A major step toward successful stem cell transplantation was the definition oft he best donor as a sibling identical for HLA-antigens, originally tested with antibodies for class I and mixed lymphocyte culture for class II. However, despite identity in the major HLA antigens severe graft-versus-host reactions occurred in about 20 to 40% of patients. A Y-chromosome coded antigen presented by HLA A02.01 was defined in a multiply transfused female patient with severe aplastic anemia who rejected the graft of her brother. In the meantime 49 minor HA are known and the international cooperation in genetic sequencing of T cell targets gives an estimate of about 10 000 to 11 000 minor HA differences between any patient and his unrelated donor. The expression of some mHA is restricted to hematopoietic tissue enabling a graft-versus-leukemia (GVL) response in the allogeneic situation. HA-1 is the most intensively studied mHA with GVL effects in vitro and in vivo. It is HLA-A02.01 restricted and immunodominant, but prospective studies failed to show advantages. Unlike autosomally coded mHA Y-chromosome encoded mHA are presented by class II and class I HLA antigens and are able to produce antibody responses. They induce strong GVL responses, but they are generally not tissue restricted and may produce GVHD. Therefore we investigated whether some forms of Y encoded mHA may show restricted tissue expression and whether we could find Y encoded antigens expressed on leukemia cells and not in normal white blood cells. UTY is a Y chromosome encoded mHA with potentially restricted tissue expression. However we found a vast number of alternative splicing forms and a multitude of transcripts without obvious tissue restriction. In cells of acute myeloid leukemia we could define 4 new antigens that are overexpressed, but only two of the transcripts produced significant T cell responses and these were rather weak.

In summary mHA have not fullfilled the hope of usefullness for cellular therapy of leukemia until today. However there is still hope that neo-antigens derived from mutations in leukemia cells may be useful, if immune escape may be blocked by antagonists of CTLA-4, PD-1 and PD-1L as has been shown in melanoma patients.

New Options for the Clinical Management of Patients with Acute Myeloid Leukemia (AML)

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In defining prognosis and assessing risk in patients with acute myeloid leukemia (AML) there are 3 broad determinants to consider:

- Characteristics of the patient (eg, older patients with multiple medical problems tend to do worse than younger patients given the same treatment)
- The nature of the leukemia, because AML is a constellation of several different diseases, not just one disease
- The therapy employed, which in some cases overcomes the other 2 determinants

Significant progress in the understanding the pathogenic mechanisms leading to the development of AML has led to the identification of numerous molecular abnormalities that may be responsible for leukemogenesis. Over the same period, large trials have established standard regimens combining cytotoxic agents for the treatment of patients with AML. Current research is attempting to better stratify patients by identifying risk factors responsible for resistance, and to discern the ways that newer agents with specific and targeted activity can be incorporated into our standard regimens.

Using current standard regimens and depending on pre-treatment characteristics, approximately 50% to 85% of adult patients with AML achieve CR. However, only approximately 25% to 45% have a long-term leukemia-free survival. This less than satisfactory outcome is by no means uniform and a number of clinical features such as age, performance status, organ dysfunction, and biological characteristics of the disease (most importantly cytogenetics) influence the outcome. Several large studies have now clearly defined the importance of cytogenetics and three broad cytogenetics risk groups have been identified: favorable, intermediate, and unfavorable. Other prognostic indicators such as mutations or abnormal expression of specific genes such as *MLL, CEBPA, FLT3, NPM1*, *DNMT3A, TET2, ASLX1*, *IDH1, IDH2, WT1, MN1, BAALC* and *ERG* have been recently described and are particularly useful in assigning risk to patients with diploid AML (intermediate risk cytogenetics group). Clearly, new treatment strategies are needed and although this is particularly true for patients who are older and have non-favorable risk features, more effective strategies are also needed for the younger patients.

Over the past several decades, despite advances in understanding the biology of AML, the standard therapy for

patients with this disease has changed very little with the notable exception of the introduction of all-trans retinoic acid (ATRA) and arsenic trioxide (ATO) in the therapy of acute promyelocytic leukemia (APL). The combination of cytarabine and an anthracycline continues to be the basis for most induction and consolidation regimens in other types of AML. Older patients with AML, particularly the septa and octogenarians and those with comorbid conditions, are less able to tolerate the traditional cytotoxic chemotherapy and our group has been pivotal in demonstrating the activity of other, less toxic strategies such as the use of hypomethylating agents decitabine and 5-azacytidine.

Better understanding of the biology of AML has identified new targets for therapeutic intervention. One of the best examples of this is the identification of the mutated form of FLT3 tyrosine kinase which confers a worse outcome in the 30% of patients whose leukemic cells bear this abnormality. Several inhibitors of FLT3 kinase have been developed and evaluated at our institution including lestaurtinib, midostaurine, sorafenib, and quizartinib (AC220) with the latter two drugs demonstrating significant activity. Currently the combination of sorafenib and azacytidine is producing remarkable responses in multiply refractory patients. Other potential targets include *NPM1* (reports suggesting a role for ATRA in *NPM1* mutated diploid AML), c-*KIT* in CBF leukemias, *IDH1* and *IDH2* mutations and various cellular signaling components which include a number of tyrosine and serine/threonine kinases. This ever expanding list of potential targets has advantages and disadvantages in terms of therapeutic intervention. The advantages include well defined hypotheses that can be tested using correlative studies to determine whether the inhibition of the specific target or pathway can be beneficial clinically. The potential problem comes from the fact that many of these targets are redundant and overlapping and as such their specific inhibition may not lead to meaningful benefits despite their significant role in leukemic cell survival. It is also clear from early studies that the many of these agents are able to achieve more meaningful responses when combined with traditional agents, such as cytarabine and anthracyclines or novel agents such as the hypomethylating compounds. They are also likely to have a major role in the post-remission/consolidation setting where they can and should be evaluated for the eradication of minimal residual disease (MRD).

Better evaluation of MRD and a better understanding of the biology of the leukemogenic cells ("Leukemia stem cells") may allow the development of new agents with alternative mode of action active against these residual cells. Relapse in AML is the result of the resurgence of leukemic cells that have escaped induction and consolidation therapy and have persisted in complete remission (CR). This MRD is not detectable by the standard techniques used to define CR; therefore, more sensitive techniques such as polymerase chain reaction (PCR) and multi-parameter flow cytometry (MFC) are used increasingly to define MRD. PCR-based strategies to detect MRD have been largely limited to patients with favorable risk disease where the fusion transcripts *AML1-ETO*, *CBFB-MYH11*, and *PML-RARA* can be monitored. This proportion can be potentially increased using the newly identified mutated genes such as *FLT3 and NPM1* as well as over-expressed genes such as *WT1*. The *WT1* gene has been reported to be expressed in over 80% of patients with acute leukemia and has been proposed as a potential marker for leukemic blasts. Indeed, high levels of *WT1* mRNA in AML were associated with a worse outcome. During follow-up, patients achieving CR became *WT1* negative and recurrence of the *WT1* transcripts predicted relapse. Other studies have confirmed the benefit of *WT1* monitoring for assessing MRD in patients with AML who have achieved CR. MRD monitoring with flow cytometry relies on the idea that AML cells frequently have aberrant antigen expression resulting from asynchronous antigen-expression, cross-lineage antigen expression, antigen over-expression, and aberrant light scatter properties. Early studies of immunophenotypic detection of MRD in AML were based on double antigen staining analyzed by fluorescence microscopy. More recent studies have demonstrated that using MFC, monitoring may be applicable to virtually all patients and allow a more precise detection of the MRD with aberrant phenotype. Some studies have reported a high frequency of immunophenotypic changes in AML patients at relapse (as compared with relative antigenic stability in ALL), Despite this, immunophenotypic evaluation of MRD by MFC has been demonstrated to be useful in predicting the risk of relapse after achieving CR. The identification of leukemia stem cells in this setting, using specific markers, would be particularly attractive as it may allow the application of specific agents with the ability to target and eradicate these leukemia-sustaining cells.

Using these cytogenetics and molecular data, the decision to proceed to an allogeneic stem cell transplant if first CR has also become more informed. For example patients with a normal karyotype and *NPM1* mutation or bi-allelic *CEBPA* mutation and without *FLT3*-ITD mutation are now considered as having relatively favorable disease and perhaps should not be offered an allogeneic stem cell transplant in first CR, whereas patients with FLT3-ITD, particularly those with a high allelic burden are likely to benefit from an allogeneic stem cell transplant. Furthermore, itb has become clear that patients with persistent MRD after induction and consolidation are more likely to relapse and could be potential for alternative strategies such as an allogeneic stem cell transplant.

MANAGEMENT OF ACUTE PROMYELOCYTIC LEUKEMIA AND STEM CELL TRANSPLANT INDICATIONS

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Treatment of patients with acute promyelocytic leukemia (APL) has dramatically changed over the past 2 decades and with current treatment strategies, long term cure is possible for most patients. Classical APL with the characteristic granules and multiple Auer rods (accounting for 80% of cases) can be easily recognized by trained pathologists. Other features such as the characteristic immunophenotype, a low white blood cell count (WBC) at presentation, and the usual concomitant coagulopathy should help with early recognition of the entity. The definitive diagnosis requires detection of the pathognomonic translocation between chromosomes 15 and 17 and/or the resulting fusion transcript, *PML-RARα,* using standard karyotype analysis, fluorescent in situ hybridization (FISH), or polymerase chain reaction (PCR), but this should not delay the initiation of ATRA is the diagnosis is suspected. Rare cases may have alternative partners for the *RARα* gene, important only due to their insensitivity to all-trans retinoic acid (ATRA). A rapid diagnostic test using anti-PML antibodies can be used to increase the speed of diagnosis.

Rapid diagnosis and initiation of therapy with ATRA can significantly improve the outcome of patients leading to most experts recommending the initiation of therapy with ATRA at the first suspicion of the diagnosis to avoid the devastating complications such as pulmonary or intracranial hemorrhage. Aggressive correction of coagulopathy with the use of blood products including platelets, fresh frozen plasma, and cyopricipitate is critical early in the course of treatment. Detection and management of infections, close attention to fluid status, and prevention and treatment of tumor lysis syndrome and differentiation syndrome are also important aspects of treatment.

Definitive therapy should be initiated as soon as the diagnosis is confirmed. Historically, this included the combination of ATRA and cytotoxic chemotherapy with some regimens omitting cytarabine in order to deliver a higher dose of idarubicin (as in the PETHEMA regimen). More recently, a number of studies have incorporated arsenic trioxide in the upfront treatment and a number of phase II studies reported high responses with single agent arsenic trioxide. We have reported our trial of a "chemotherapy-free" regimen of ATRA plus arsenic trioxide with the use of gemtuzumab ozogamycin (GO) in patients with high risk disease (defined by WBC at presentation being > 10×10^9/L), and in patients with low risk disease whose WBC rises above 10×10^9/L during the course of therapy. This led to a European randomized trial where the ATRA plus arsenic regimen was compared with ATRA plus idarubicin in patients with low risk APL (WBC ≤10×10^9/L, accounting for about 2/3 of patients in most series). The chemotherapy-free regimen was associated with a significant improvement of event-free and overall survival establishing it as standard of care in these patients. A recent report from the US Intergroup has confirmed the feasibility, and potential superiority of the triple combination of ATRA,

arsenic trioxide and gemtuzumab ozogamycin over the traditional chemotherapy and ATRA in patients with high risk disease. Another recent study conducted by the United Kingdom also confirmed the efficacy and feasibility of such a "chemotherapy-free" regimen in both low and high risk patients.

Using these strategies, the main mortality risk in patients with APL is delayed diagnosis and delay in the initiation of the life-saving treatments. With appropriate therapy, the risk of relapse in both low and high risk patients is minimal and few patients will be candidates for autologous or allogeneic stem cell transplant. Many authoritities recommend further use of arsenic trioxide at relapse and then conducting autologous stem cell transplant when the patient achieves complete molecular remission after a few cycles of arsenic trioxide. The rare refractory patients who fails to achieve a response to arsenic-based therapy is a candidate for an allogeneic stem cell transplant.

The importance of imaging in the diagnosis of pulmonary complications after HSCT

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Introduction:

Bone marrow transplantation is frequently performed to restore hematologic and immunologic competence after chemotherapy and radiation therapy for a range of malignancies, as well as to treat various congenital conditions in which hematologic and immunologic functions are depressed or absent. Potentially devastating complications may occur during the pre-engraftment period after bone marrow transplantation, when marrow aplasia may supervene for several weeks until engraftment occurs, as well as during the post engraftment period (the 3 months after engraftment) and in subsequent months and years. Complications of bone marrow transplantation may be classified either according to the time interval between transplantation and the occurrence of the complication or according to the organ system affected. Pulmonary infections are one of the most common complications following the BMT, representing the main cause of death in these patients. The early diagnosis and specific treatment of the pulmonary infections are essential to long-term success of the BMT .CT scan is the gold standard imaging technique for early diagnosis or exclusion of pulmonary infections in febrile neutropenic patients following BMT. However, the most common CT findings are usually non-specific and shared between the different causes of infection after marrow transplant. Pulmonary abnormalities after BMT occur in approximately 50% of recipients. Consequently, infective complications predominate in the early post-transplantation period and non-infectious complications, such as bronchiolitis obliterans (BO), become more common after the first few months. Early recognition is important for prompt treatment, but unfortunately, the radiographic findings are frequently non-specific. Correlation of the CT features with the different immunological phases after BMT has been considered helpful in narrowing the differential diagnosis.

Informed consent versus understood consent

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Informed consent is the communication between the physician and patient that leads to the patient agreeing to undergo a medical intervention. A valid informed consent involves three components: disclosure, capacity and voluntariness. The physician should disclose and discuss: The diagnosis, the nature and purpose of treatment or procedure, the risks and benefits of proposed treatment or procedures, alternatives, the risks and benefits of alternatives, the risks and benefits of not receiving treatments or undergoing procedures.
Sometimes patients became dissatisfied with their treatment team, despite receiving appropriate and good care because they felt inadequately prepared and lack of proper information before and during their procedures. This may be due to failure to achieve understanding despite informed consent.
There are some reasons for misunderstanding which could be resolved by some cautions:
- Minimizing the differences between doctor-patient expectation from therapy
- Improve the patient-physician relationship
- Using more effective comprehension techniques
- Using interactive technology and enhancing consent forms
- Better regulation of the time of getting consent prior and during the procedure

There can be a wide difference and disconnect between the explanation of and the actual experience of undergoing therapy or procedure. A good informed consent should be viewed as an ongoing process before, during and even after the process of procedure, rather than just before it.

Genital GVHD

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Abstract

Female genital GVHD affects the vulva and vagina and is reported in 25 to 49% alloHSCT survivors. Female genital GVHD is more common after peripheral blood stem cell transplantation than bone marrow transplantation. Genital GVHD most frequently appears in the vulva (68%) or the vulva and vagina concomitantly (26%). Symptoms of genital GVHD include dryness, burning, itching, pain to touch and dysparonia. Vulvar signs including patchy or generalized erythema, tenderness on Q-tip palpation and erythematous vestibular gland openings.

Fungal infection after HSCT (Diagnosis and treatment)

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Invasive aspergillosis (IA) is a life-threatening infection in severely immunocompromised haematological malignancy patients, with an incidence rate of approximately 10% in allogeneic bone marrow transplant recipients, and an overall case-fatality rate of 58% (range 43–87% depending on underlying disease), largely related to delayed diagnosis. Patients with IA have a significantly increased length of stay (LOS) in hospital and increased healthcare costs compared with patients without IA. Many patients with clinical suspicion for the presence of an IFI are treated empirically with antifungal therapy that may involve the unnecessary use of potentially toxic and costly drugs, because diagnosis of IA in hematology patients remains a challenge. Overtreatment can be reduced by use of rapid, non-culture-based diagnostic tests to direct antifungal therapy. Early detection of diagnostic markers of a fungal infection, such as fungal nucleic acids (PCR), antigens, antibodies, or cell wall components, is essential in this regard. Two serum fungal diagnostic tests, the galactomannan (GM) test, and the b-(1-3)-D glucan (BDG) test may aid in the detection of common invasive fungal infections (IFIs). A single negative result should not be used to rule out the diagnosis of an invasive fungal infection. Serial serum monitoring for either of these fungal wall elements can be used to guide initiation of preemptive antifungal therapy in high-risk patients.

Galactomannan is a polysaccharide cell wall constituent of Aspergillus species that is released during hyphal growth, and its detection may improve the early diagnosis of IA. Assay results are reported in terms of the galactomannan index (GMI) or optical density index (ODI). A GMI of 0.5 is the cutoff for positivity currently approved by the FDA. Use of a higher cutoff value increases the likelihood of false-negative results, while a lower cutoff increases sensitivity and the risk of false-positive results. False-positive results can occur due to use of ß-lactam antibiotics (piperacillin tazobactam, amoxicillin-clavulanate), presence of certain other invasive mycoses (Penicillium, histoplasmosis, or blastomycosis), or use of plasmalyte in BAL fluid or other infusion solutions. False-negative results can be owing to prior or concomitant antifungal therapy, an infection that has been walled off, or low fungal burden.

BDG is a component of the cell wall of most fungi. The BDG test detects most of the relevant fungal pathogens, including Candida species, Aspergillus species, Pneumocystis species, and Fusarium species (but not the zygomycetes agents or Cryptococcus species, which release no or little BDG to be detected in human serum), with high levels of sensitivity and specificity reported in studies. The diagnostic performance of BDG testing for IFIs evaluated in one meta-analysis seemed to be similar to that of galactomannan detection used for the diagnosis of IA. It is likely that for some patients with IA that is not identified with galactomannan testing, BDG testing could be used to make a diagnosis more quickly. Different BG assays have similar accuracy for the diagnosis of IFI in hemato-oncological patients. Two consecutive positive antigenemia assays have very high specificity, positive predictive value, and negative predictive value. Because sensitivity is low, the test needs to be combined with clinical, radiological, and microbiological findings. Caution is also warranted in the presence of factors that could increase BDG levels for reasons other than IFI, such as hemodialysis with cellulose membranes and hemofiltration, blood transfusions, administration of human blood products (immunoglobulins or albumin), use of such antibiotics as amoxicillin-

clavulanate or piperacillin-tazobactam, presence of serious bacterial infections, use of surgical gauzes containing glucan, or severe mucositis.

Analyses of sensitivity and specificity suggest that galactomannan and PCR assays enable earlier, more accurate diagnosis of invasive aspergillosis than do traditional culture and histological methods. Broad-spectrum, mold-active prophylaxis impairs the performance of galactomannan and PCR testing. When screening high-risk patients for IA with serum GM and PCR tests, the absence of any positive test can obviate the need for antifungal agents with a negative predictive value of 100%, whereas the presence of at least 2 positive results is highly suggestive of an active infection with a positive predictive value of 88%. In summary, combination screening with GM and PCR, when performed at least once weekly, can lead to effective screening for the disease in high-risk patients. Indeed, with this screening approach, the posttest probability of IA can reach zero when both GM and PCR are consistently negative, decreasing the need for further testing or empiric treatment.

Measuring GM in BAL fluid is also an attractive option, given that the lungs are the most common site of Aspergillus infection. The diagnostic performance of PCR in BAL fluid is good and comparable to that of GM in BAL fluid and studies favor the use of PCR in BAL fluid for patients with suspected invasive pulmonary aspergillosis and point to the combination of PCR and GM as the optimal testing strategy (optimal sensitivity and PPV values without a significant loss in specificity). However, standards for PCR performance in BAL fluid are needed.

The Infectious Diseases Society of America (IDSA) recommends that voriconazole be the first choice of primary therapy for IA in patients with haematological malignancies. In this patient population, primary caspofungin monotherapy may be less effective than voriconazole, and routine administration of both voriconazole and an echinocandin may not provide an advantage. In fact, data have revealed that combination salvage therapy may be associated with significantly more adverse events than monotherapy. Hence, the data support the IDSA's specific recommendations on combination therapy with voriconazole plus an echinocandin as previously stated: 'in the absence of a well-controlled prospective clinical trial routine administration of the combination for primary treatment is not routinely recommended'. However, on the basis of an analysis of the medical literature, some experts believe that combination therapy with voriconazole and an echinocandin may be useful as salvage therapy in some high-risk patients, such as those who have undergone allogeneic HSCT or who have a high fungal burden, as reflected by positive GM.

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Complications of Hematopoietic Stem Cell Transplantation (HSCT) can affect nervous system alongside with other systems. Complications can vary from simple headache or dizziness to fatal intracranial hemorrhages. One third to more than half of HSCT patients can have neurologic problems, according to reports of different centers. We have seen neurologic complications in about one third of our patients. Etiologically, complications can be related to metabolic causes (septic or metabolic encephalopathies), relapse of primary disease (CNS relapse, pathological fractures from bone metastasis, etc), infections (fungal, opportunistic viral and bacterial), cerebrovascular disorders (hemorrhagic and ischemic strokes), drugs (peripheral neuropathies, seizure, encephalopaties, etc) and autoimmune disorders (GVHD, myasthenia gravis, neuropathies, etc). Symptomatologically, headache and dizziness, limb weakness, diplopia and seizure were the most common signs and symptoms in our study which mostly were due to relapse, drugs and intracranial hemorrhage. In treating these patients, the cause should be sought and dealt with. However, symptomatic treatment should not be ignored or forgotten. Drugs with least bone marrow toxicity and drug interaction are preferred.

Outcome improvement following haploidentical stem cell transplantation in patients with high- risk leukemia: A comparison of high-dose post-transplant cyclophosphamide (PT-CY) versus prophylactic DLI

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Introduction: Haploidentical transplantation has become a clinical option for patients lacking an HLA-matched donor. Multiple methods have been developed to improve outcome after haploidentical stem cell transplantation (SCT). High-dose cyclophosphamide in the early post- transplant period (PT-CY) is an effective strategy for GVHD prevention and engraftment facilitation due to immunogenic tolerance. Prophylactic DLI was applied to reduce relapse rate and improve immunity reconstitution after haploidentical SCT. Here, we report the outcomes of 58 patients receiving haploidentical SCT at our center. All patients were randomized to three arms: PT-CY, Prophylactic DLI and control group.

Materials and Methods: From Jun 2010 to November 2015, 58 high-risk acute leukemia patients (42 males, 16 females, 39 AML, 19 ALL) lacking a suitable related or unrelated donor underwent haploidentical SCT from family members. The median age was 25.5 years in PT-CY and DLI arms, while it was 22.5 years in the control group. GVHD prophylactic regimen and conditioning regimens were identical in all groups. The myeloablative conditioning regimen composed of busulfan /cyclophosphamide and ATG. GVHD prophylaxis consisted of cyclosporine and methotrexate. In PT-CY arm, patients underwent HSCT and then received additional dose of cyclophosphamide 40mg/kg at +3, +4. In DLI arm, patients without any evidence of severe GvHD following transplantation received DLI from the same donor on day +30 with average cell dose of 1-2×10^7 (MNC)/kg.

Results: Totally, 58 patients were enrolled in this study and randomized to three arms. Acute GVHD (grade 3-4) occurred in 6 (17.6%) , 3 (21.4%) and 4 (40%) patients in PT-CY , DLI and control arms, respectively (P-value=0.328).Chronic GVHD (moderate and severe) occurred in 3 (13%),3 (30%) and 4 (66.7%) patients in PT-CY , DLI and control groups (P-value=0.034). Relapse occurred in 20.6%, 14.3% and 20% of PT-CY, DLI and control groups, respectively (P-value=0.366). One-year overall survival was 58.7%, 64.3% and 37% in PT-CY, DLI and control arms (P-value=0.572). A total of 23 deaths occurred in this study. The main causes of death were infection, GVHD and relapse. The common causes of death were infection (80%) and GVHD (40%) in DLI arm, while the most common cause of death in PT-CY arm was relapse (41%).

Conclusion: The results of this study revealed no statistically significant difference in DFS, OS and acute GVHD among the three treatment arms, probably due to the small size of patients and short time of follow-up. However, chronic GVHD was significantly lower in PTC arm, acute GVHD was clinically lower in PT-CY arm and relapse was lower in DLI arm.

Keywords: Cyclophosphamide , Prophylactic DLI, Haploidentical transplantation

Multiple Myeloma: allogeneic or autologous hematopoietic stem cell transplantation?

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Hematopoietic stem cell transplantation (HCT) significantly increase chance of survival in multiple myeloma (1). So doing HCT is a common practice for these patients.

Currently autologous HCT is an accepted method (2) and prolong survival, but usually is not curative and most cases relapse after some times. These relapse will affect survival especially for younger patients.

Another option is allogeneic HCT. Theoretically relapse rate is lower because graft is clean and also immunologic reactions of graft against myeloma cells (graft versus myeloma effects) (3). Despite these advantage, it has higher early mortality because of transplantation complications (4, 5). So many trials reduced conditioning intensity to improve early mortality rate (6).

Recently introduction of new drugs to treatment of multiple myeloma changed this paradigm and patients how relapse after first HCT can achieve to second disease control by new drugs.

So currently preferred method for HCT in MM is autologous stem cell transplantation (2). But the issue of allogeneic HCT is challenging yet for example in high risk MM (including t(4;14), t(14;16), t(14;20), del17p13, and/or del1p32 or poor responder to first line chemotherapy) especially when patient performance is good and has full match donor.

Another issue is that in younger MM patients, relapse after autologous HCT would affect survival in longer follow up and beneficial impact of allogeneic would appear in long term survey.

We performed allogeneic HCT in our center for patients who are relatively young (less than 55 years old) with good performance, have match sibling donor and accept allogeneic HCT. In a retrospective study we compared its results with autologous HCT.

From 1992 we did HCT in 580 MM cases. Between them 504(87%) received autologous HCT and 76 (13%) received allogeneic HCT from full match sibling donor. For homogenization of study we only include cases who received HCT from 2011. Between this cohort (301 cases) , 237(79%) received Auto-HCT and 64(21%) allo-HCT.

Mortality rate for Auto-HCT was 4% and for allo-HCT was 12.5%. The most common cause of mortality between two groups were relapse of primary disease.

Relapse rate in auto-HCT was 10% and allo-HCT was 12.5%.

Two year survival for auto-HCT was 93%+/- 0.021 and for allo-HCT 88%+/-0.05 (P=0.03) (fig-1)

For auto-HCT 2 year DFS was 84%+/-0.03 and 71%+/- 0.07 for allo-HCT (p=NS) (fig-2)

So we can conclude that at least in short term follow up, auto-HCT is superior to allo-HCT (probably because of higher TRM) and allo-HCT cannot affect relapse rate in first two years.

We suggest that this study need longer follow up to see whether allo-HCT in long term prevent relapse or not, and also we can perform allo-HCT in selected cases such as high risk cases or relapsed refractory MM patients .

Fig-1: overall survival for allo Vs auto transplantation in MM

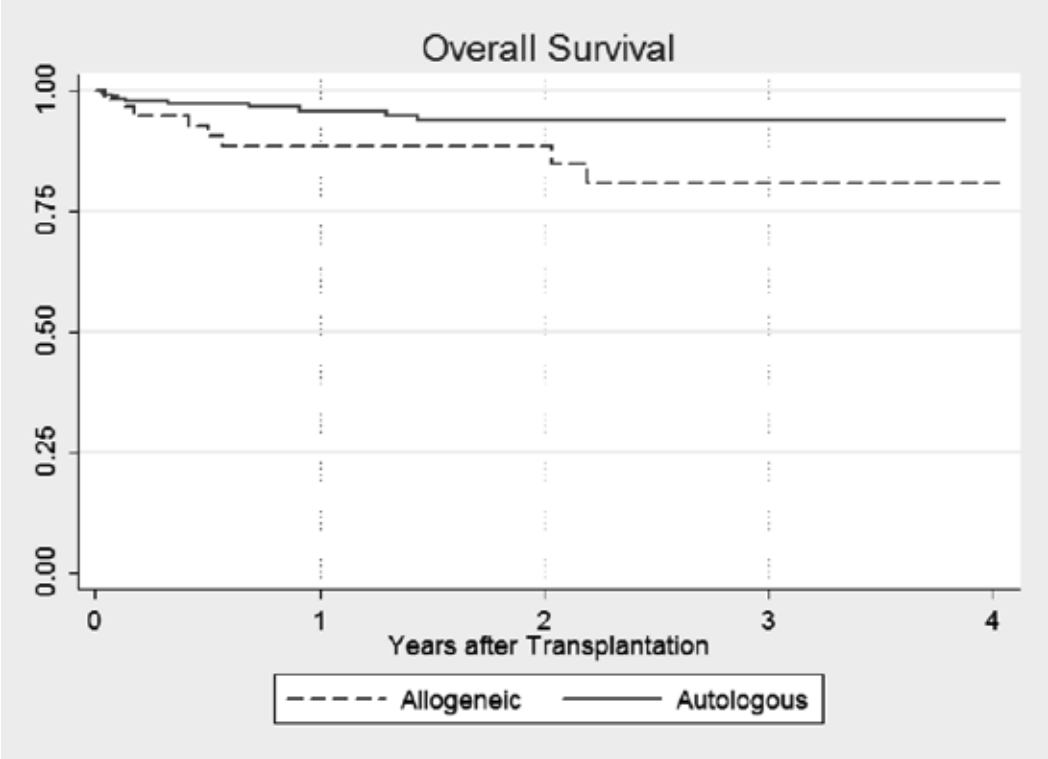
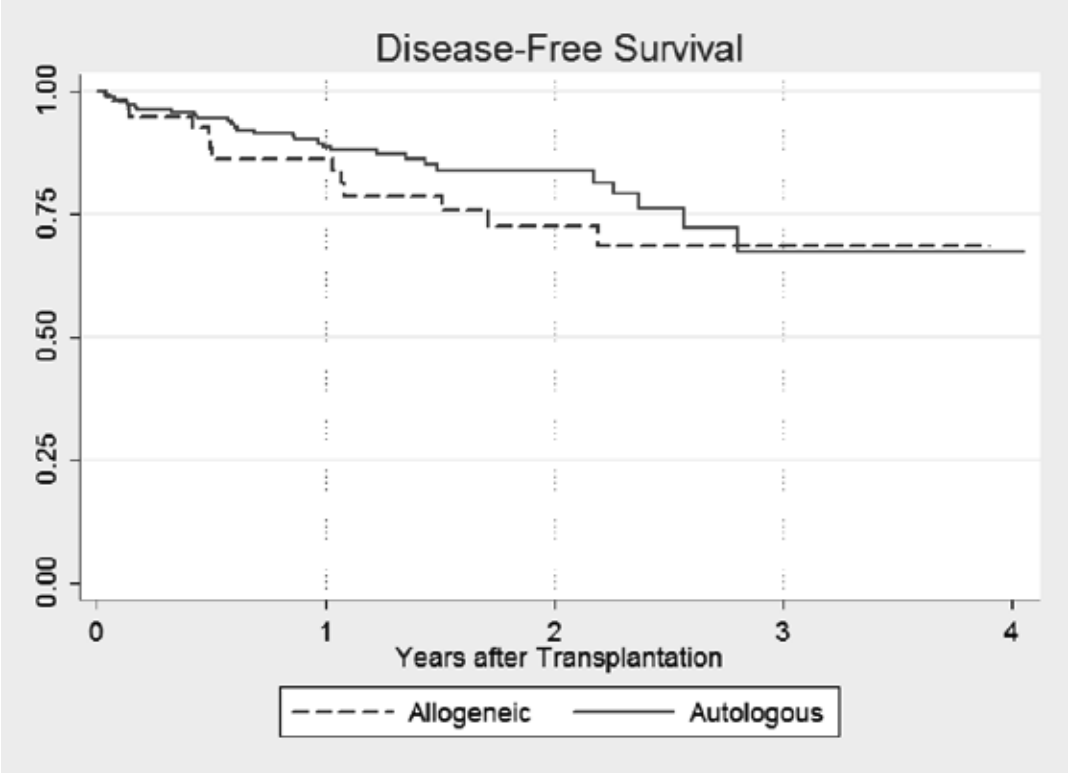


Fig-2 DFS for allo Vs auto transplantation in MM



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Application of mesenchymal stromal cells for the prevention and treatment of graft-versus-host disease

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Human mesenchymal stromal cells have potent immunosuppressive and anti-inflammatory effects that might represent an attractive cell source for therapeutic applications. These cells dictate T cell functions which suppress the adaptive immune response and it was also revealed that MSC impede dendritic cells (DCs) maturation and augment anti-inflammatory functions and decrease the production of inflammatory cytokines. MSCs can be used peri-HCT or pre-engraftment to modulate immune reconstitution, immunosuppressive capacities of hMSCs promoting hematopoietic stem cell (HSC) engraftment and/or further, it has been also demonstrated that the use of hMSCs reversed severe acute graft-versus-host disease (GVHD).

The etiology of aGVHD involves an allogeneic cytotoxic reaction of donor lymphocytes, the cornerstone of aGVHD treatment is immunosuppression, with the purpose of inducing donor/recipient tolerance without eliminating the graft-versus-leukemia/graft-versus-lymphoma (GVL) effect

We conducted a study which 103 major thalassemia patient received full matched allogeneic hematopoietic stem co-transplanted with bone marrow derived mesenchymal stem cells (MSCs) from healthy donor. The purpose of this study is to report the mesenchymal stem cell therapy for acute graft-versus-host disease, particularly with respect to immunomodulation

MSCs appear to be safe and well-tolerated for use in cell therapy, and, as a treatment modality, can provide hope to patients with steroid-resistant aGVHD. The results of clinical trials have thus far been encouraging, and research in this field continues to improve.

How to select the best donor for haploidentical HSCT

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The first degree relatives are the main source of haploidentical stem cell donors. They include father, Mother, the patient siblings with similar paternal HLA haplotype (NIMA mismatched siblings), siblings with shared maternal haplotype (NIPA mismatched siblings), and patients offspring.

The choice of the best donor among these five groups is somehow controversial. The age and sex factors and the pregnancy history of female donors further complicate the problem.

It seems that the protocol of transplantation has main impact on the contradicting reports. T cell depleted transplantations with maternal donors had better outcomes than the ones with paternal donors (Stern et al. 2008). In T cell replete transplantations the reports are different. Van Rood (2002) reported less graft failure and early chronic GVHD for maternal grafts. Wang (2014) reported significantly better outcomes for paternal grafts. Y. Sun (2015) reported that, father-to-son donation had the best outcome, followed by mother-to-daughter and mother-to-son transplantation. Father-to daughter donation had the worst results.

Most authors regard sibling donors better than parental donors (Van Rood 2002, Ichinohe 2004, and Wang 2014). In the case of male patients Wang reported better outcomes for paternal transplantations than grafts from older (30 years or older) sister donors. NIMA mismatched siblings were better than NIPA mismatched siblings but donor's age was more important (Wang 2014).

Most authors reported better results for transplantations from offspring than sibling grafts (Ichinohe 2004, Wang 2014). In those cases, donor age was more important than relationship (Wang 2014).

In conclusion, it seems that from different first degree haploidentical relatives, the younger (30 years or less) and then NIMA mismatched (siblings and offspring for female patients) donors are preferred and parent donors are the last choice.

HSCT in Pediatric ALL Patients vs. Chemotherapy

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The treatment of choice for the child with AML after attaining a first remission and ALL after second remission has been the central question in a number of multi- and single institution studies as well as analyses by the International Bone Marrow Transplant Registry and the National Marrow Donor Program over the past 20 years. An important goal of treatment of childhood ALL is to accurately identify children likely to be cured with chemotherapy alone, and to offer HCT early (in first remission) to those with a low chance of cure with chemotherapy.

Treatment options include allogeneic HCT using an HLA-matched sibling, intensive chemotherapy with or without a maintenance phase, or autologous HCT with or without purging of the marrow inoculum. However, there is a growing body of data which looks at the use of alternative donor transplants-specifically unrelated donor marrow and unrelated cord blood grafts. For pediatric patients, many institutions consider a well matched unrelated donor equivalent to a matched sibling.

If a child does not have a matched sibling, then the usual treatment plan includes primary intensive conventional chemotherapy. Alternative donor HCT may be considered in CR1 for high-risk cases or when the patient relapses during or soon after conventional therapy. The source of the alternative donor hematopoietic cells will depend on a number of factors which includes the underlying diagnosis and stage of disease, degree of mismatch for the various potential hematopoietic cell sources and cell dose available based on the size of the patient.

In the future, HCT is likely to advance toward a selective component therapy in order to become a less toxic and more effective treatment for a broader range of patients. Because tumor cells use multiple mechanisms of immune evasion, a combination of several approaches, rather than a single treatment, will be necessary.

Outcome of Hereditary Bone Marrow failure Syndromes Given Allogeneic Hematopoietic Stem Cell Transplantation Conditioned with Busulfan-based Regimen

Amir Ali Hamidieh, Maryam Behfar, Amir Kasaeian, Tahereh Rostami, Zahra Darvish, Ashraf-sadat Hosseini, Ardeshir Ghavamzadeh

Introduction: Inherited bone marrow failure syndromes (IBMFSs) include a rare group of genetic disorder that usually manifested by single or multi-lineage cytopenias in childhood period. Hematopoietic stem cell transplantation (HSCT) is the only curative approach for just the hematological abnormalities in majority of these patients. The purpose of this study is to investigate the outcome of HSCT using Busulfan based conditioning regimen in Fanconi anemia (FA) and Diamond-blakfan anemia (DBA) who referred to our center.

Methods: Retrospectively, we analyzed the results of 125 patients diagnosed with FA (n=115) and DBA (n=10) who underwent HSCT from 1995 to 2014. The median age at transplant were 10.2 years (rang: 2-48) in FA and 5.1 years (rang: 1-15) in DBA. Patients were transplanted from HLA-identical sibling (n=72), HLA-matched relative (n=33), HLA-match unrelated (n=10), HLA-mismatch sibling/other related (n=7) and HLA-mismatch unrelated (n=3). Peripheral blood (n=80), bone marrow (n=37) and cord blood (n=8) were used as the source of stem cells. All patients received the same TBI-free conditioning regimen based on Busulfan in combination with Cyclophosphamide. Low-dose Busulfan was used in FA, while it was standard dose in DBA. According to our center protocol, we used Antithymocyte globulin (ATG) in patients with non HLA identical sibling donors or history of frequent blood product transfusion. Cyclosporine with or without Methotrexate was used as graft-versus-host disease (GvHD) prophylaxis regimen.

Results: With median follow up 3.9 years (SE: 2.91), 2 years overall survival and disease-free survival for FA were 76.32% (SE: 4.23) and 71.54% (SE: 6.51) and they were 90% (SE: 9.49) and 78.75% (SE: 13.4) in DBA, respectively. Acute GvHD occurred in 45 FA (28 patients grade I-II, 17 grade III-IV) and 5 DBA (3 patients grade I-II, 2 grade III-IV). Considering chronic GvHD for FA and DBA, results were 12 and 2. GvHD and infection were common cause of death in our patients.

Conclusion: Although with introduction of HSCT has significantly improved the survival of IBMFSs, there is ongoing concern about secondary malignancy especially in FA after HSCT related to radiation. The result of our study shows HSCT using TBI-free conditioning regimen based on Busulfan was associated with favorable outcome and these results especially in FA are comparable with the results of Fludarabin-based regimes. A multicenter, prospective study is needed to define the best regimen for these patients.

Outcomes of Hematopoietic Stem CellTransplantation in Thalassemia Major Patients: An Impact of donor type

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Introduction: Although allogeneic hematopoietic stem cell transplantation (HSCT) is known as curative therapy for children suffering from β-thalassemia major (TM), which is the most common hemogolobonopathy in the world, a number of questions remain to be answered such as selection of the best donor type. In this retrospective study, we explained the results of HSCT in TM patients based on donor type from March 1991 to December 2014.

Patients and Methods: 663 TM patients (330 males and 333females) underwent HSCT using HLA identical sibling (n=608), full matched other related donor (n=48) and fully matched unrelated donor (n=7) at our center. Low resolution typing of HLA-A, -B and -DRB1 in sibling donors and high resolution typing for class I and class II alleles in other or unrelated donor were performed. We compared the results obtained in 608 patients with HLA identical sibling donor (group1) and 48 patients who had received HSCT from full matched other related donor (group2). Due to the small number of unrelated group, we just reported the outcomes (group3).The median age at the time of transplantation was 9.49 years (range: 2-30years) in group1, 7.83 (range: 2-17years) in group2 and 5.71 (range: 2-14years) in group3.Bone marrow (206 in group1, 31 in group2, 2 in group3), peripheral blood (395 in group1, 17 group2, 3 in group3) and cord blood (7 in group1, 2 in group3) were used as stem cell sources.All patient received conditioning regimen according to their age and Dr. Lucarelli classification. Cyclosporine A with or without methotrexate was used as graft-versus-host disease (GvHD) prophylaxis regimen.

Results: The median follow-up was 5.6years (95% CI: 4.64-5.5).Rejection occurred in 63 patients in group1 and 7 patients in group2. 257 (42.27%) and 30(62.5%) patients experienced acute GvHD in group1 and 2, respectively. 264(43.27%) and 24(50%) patients experienced Chronic GvHD in group 1 and 2, respectively. Although acute GvHD occurrence was statistically significant between the 2 groups (p-value=0.007), chronic GvHD occurrence was not statistically significant (p-value=0.37) between the study groups. Five-year overall survival (OS) and disease-free survival (DFS) for patients in group1 were 76.81% (95% CI: 73.03-80.14) and 70.39% (95% CI: 66.16-73.66), while they were 68.8% (95% CI: 47.71-81.9) and 52.82% (95% CI: 34.14-69.96) in group2, respectively. OS and DFS of patients in 2 groups showed no significant difference (P.value=0.5, 0.12).The most common causes of death were GvHD and infection in both groups. In group 3, engraftment occurred in all patients. Acute GvHD occurred in all patients (6 patients developed grade I-II and 1 of whom showed grade III-IV) and 4 patients developed limited chronic GvHD. OS and DFS were 100% in this patients.

Conclusion: Although our results indicate that acute GvHD in patients with HLA identical sibling donor is lower than others, survival after HLA- matched other related allogeneic transplant is comparable with HLA identical sibling transplant.HLA matched other related allogeneic transplant is a chance of cure in these patients.

Management of pulmonary GVHD

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Management of pulmonary GVHD (graft versus host disease) depends on correct diagnosis. Pulmonary GVHD could acute or chronic and imply to some noninfectious HSCT (hematopoietic stem cell transplantation) pulmonary complication. Pulmonary Complications associated with acute GVHD include diffuse alveolar damage and interstitial pneumonitis. Chronic GVHD mainly refers to Obliterative bronchiolitis (OB) is a leading cause of progressive airflow obstruction. Late IP (interstitial pneumonitis) as well as COP (cryptogenic organizing pneumonia) may occur in association with chronic GVHD and are regarded as 'associated' of chronic GVHD.

Pulmonary chronic GVHD can present with obstructive and/or restrictive changes.

Early diagnosis may improve clinical outcome, and regular post-transplant follow-up PFTs are recommended. Diagnostic work-up includes high-resolution computed tomography, bronchoalveolar lavage and histology. BAL is recommended early and in patients for proofing or excluding of pulmonary infection.

Management of pulmonary GVHD is a stepwise manner and base on disease severity. In early OB, Topical treatment with inhalative steroids plus beta-agonists may improve disease. Combination therapy of budesonide as an inhalative steroid and formoterol as a long-acting bronchodilator in recent trial was promising result. Early addition of azithromycin is suggested. Preliminary clinical observations indicated potential therapeutic efficacy for montelukast, a leukotriene receptor antagonist, in OB following allo-HSCT.

Systemic immunosuppressive therapy may be started up-front in patients initially presenting with moderate-to- severe clinical conditions. Also, Systemic corticosteroids plus or minus another immunosuppressive therapy started if the symptoms don't response to inhaled therapy.

In refractory OB cases, second-line therapy includes extracorporeal photopheresis, mammalian target of rapamycin inhibitors, mycophenolate, etanercept, imatinib and TLI (total lymphoid irradiation), in single or combination therapy be used. Tyrosine kinase inhibitor imatinib in pulmonary chronic GVHD was used based on its antifibrotic properties, and also, in combined obstructive–restrictive chronic lung injury following HSCT, imatinib (100–400 mg daily) led to a significant

improvement.

Antibacterial Treatment in HSCT

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Introduction:

Infection is a major complication of hematopoietic stem cell transplantation. Bacterial infections are the most prevalent pathogens during the pre-engraftment phase and can be rapidly fatal if not promptly treated.

Bacterial infection management:

As mentioned in literature, since any delay in starting an effective antibiotic therapy for the treatment of bacterial infections has been associated with an increased mortality, empirical therapy directed against gram negative bacteria has been a cornerstone of managing bacterial infections during neutropenic early phase after HSCT. If a causative infectious agent has been identified, modification of the empirically started antibacterial therapy should be considered. In the post-engraftment phase, presence of GVHD poses an additional risk for bacterial infections.

Broad-spectrum antimicrobial therapy for the management of febrile neutropenia is well established. Options include single agent therapy with a third- or fourth-generation cephalosporin or a carbapenem with antipseudomonas activity. . In the case of skin or venous catheter infections and mucositis, addition of glycopeptide antibiotic to the initial empiric regimen should be considered.

The antibiotic of choice can be modified depending on the clinical symptoms: history of recent cultures from the blood, respiratory tract, gastrointestinal tract, or genitourinary tract and local resistance patterns.

Conclusion:

The types of bacterial infections seen during the pre engraftment period (earlier than day +21) are primarily related to neutropenia. The risk for bacterial infections continues after engraftment. Bacterial infections should be managed on the basis of clinical symptoms, physical examination, previously cultured organisms, and local resistance patterns.

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Psychosocial Issues in Hematopoietic Stem Cell Transplantation

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Hematopoietic Stem Cell Transplantation (HSCT) is a complex medical procedure used in the treatment of a variety of diseases. HSCT has moved from an experimental treatment to become an accepted therapy. At the same time, the primary focus on increasing survival in previously lethal diseases has been enlarged to encompass psychosocial issues such as quality of life.

The diagnosis of a deadly disease and the option of a treatment that may cure but which also has potentially lethal side effects puts the patient under heavy pressure and adjustment is difficult. Psychosocial morbidity is frequent, particularly adjustment disorders with symptoms of depression and anxiety. Psychosocial issues in patients, donors, families and transplant teams are have a substantial impact on the morbidity of all persons involved and probably on the survival of patients.

At long-term follow-up, some survivors have to cope with a low energy level, some with fear of losing their job, and all have to deal with infertility and the fear of relapse and secondary malignancies. Non-compliance is one the main factors of transplant failure. Poverty is a potential factor in non-compliance that is often neglected.

Communication and psychosocial skills are core competencies for doctors and nurses. They cannot be delegated to mental health professionals. Every transplant unit must have a mental health professional who is a team member of the transplant team. A consulting psychiatrist coming solely on request as demanded is not sufficient. The tasks of a mental health professional regularly working in the transplant unit and its outpatient department is to care for individual patients and their families, and to support the transplant team.

CNS prophylaxis in ALL pre and post Hematopoietic stem cell transplantation

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HSCT is an effective treatment for acute lymphoblastic leukemia (ALL). Despite advances in therapy, disease progression remains the major cause of mortality following allogeneic HSCT accounting for 20–50% of all deaths. The central nervous system (CNS) is the most common extra-medullary site of disease progression after transplant in ALL.

Effective strategies to control the primary disease and to reduce the incidence of CNS relapse, including early and frequent combination therapy with systemic CNS active agents, CNS irradiation, and intrathecal therapy, have reduced the incidence of CNS progression prior to, and after, transplant.

Although the use of CNS prophylaxis as part of the upfront treatment for ALL has led to significant decreases in CNS relapse and improved outcomes overall , the routine use of post-HSCT prophylactic CNS therapy as a strategy to prevent CNS relapse after transplant is still controversial.

Studies that utilized post-HSCT CNS prophylaxis have reported disparate results and there is no generalized consensus regarding the role of post-transplant CNS prophylaxis to prevent CNS relapse. The practice of post-HSCT prophylactic CNS therapy varies from center to center. Preventing CNS relapse after HSCT remains a therapeutic challenge, and criteria for post-HSCT CNS prophylaxis have not been addressed.

In conclusion, CNS relapse is an uncommon event following HSCT for ALL in CR1 or CR2, but with higher risk among patients with CNS involvement pre transplant. Furthermore, neither the use of post-HSCT CNS prophylaxis nor the intensity of the HSCT conditioning regimen made a significant difference in the rate of post-HSCT CNS relapse.

Hepatitis virus management in HSCT

Siavosh Nasseri-Moghaddam MD, MPH, AGAF

Patients undergoing hematopoietic stem cell transplantation (HSCT) are at *very high risk* for hepatitis B (HBV) reactivation and flare. HBV reactivation under these circumstances is associated with up to 25-50% chance of liver failure and death. Therefore, all HSCT candidates need to be screened for HBV by assessing the hepatitis B surface antigen (HBs Ag) and the antibody to core antigen of hepatitis B (HBc Ab) in serum in order to see if prophylactic antiviral treatment is necessary. Anti-hepatitis B surface antibody (HBs Ab) is better to be checked at baseline, but does not affect the decision for prophylactic treatment. If HBs Ag is positive, then the patient needs to be fully assessed for: 1) HBV replication (by HBV DNA, HBe Ag, HBe Ab), 2) liver injury (AST, ALT levels, transabdominal ultrasound +/- fibroscan, platelet count), 3) liver function (prothrombin time, total and direct bilirubin, serum albumin), 4) hepatocellular carcinoma (serum alpha-fetoprotein, transabdominal ultrasound), 5) concomitant infections (hepatitis D & C, human immunodeficiency virus by anti HDV Ab, anti HCV Ab, and anti HIV Ab), and 6) renal function (serum creatinine). If the patient has evidence of chronic liver injury by HBV, he/she needs to be treated as a case of chronic hepatitis before HSCT. If the patient is only positive for HBsAg &/or HBcAb, he/she needs to received prophylactic treatment, preferentially starting at least four weeks before HSCT if possible. Either tenofovir or entacavir can be used. In patients with renal insufficiency entecavir is preferred, while in patients previously treated with lamivudine, tenofovir should be used. In most instances treatment needs to be continued life-long as immunosuppression will be continued. The patient needs to be monitored with ALT and HBV DNA at intervals.

Infection with hepatitis C virus (HCV) is also associated with poorer outcomes in patients undergoing HSCT. Therefore, all HSCT candidates need to be assessed for HCV (anti HCV Ab & HCV RNA) as well and if positive be screened for active or chronic liver disease. Interferon and ribavirin are neither effective nor tolerated by these patients. Newer antivirals seem to be promising. A 12 week course of Sofosbuvir and Daclatasvir is indicated in non-cirrhotic HCV patients undergoing HSCT.

Evaluation of the Donor-Derived Hepatocyte Cell Repopulation inCo-transplantation of HSCT with Mesenchymal Stem Cells in Major Thalassemia Class III

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Introduction

Mesenchymalstem cells with a capacity for self-renewal and thepotential to differentiate into bone, cartilage, marrow stroma and the other tissues have been identifiedin human bone marrow.In this study we attempted to determinewhether circulating stem cells and mesenchymal cells have a similar potential in major thalassemia class III, detect donor-derivedhepatocytes insex-mismatched recipientsand assess the effect of tissue injury on theextent of the repopulation.

Methods

From 126 sex mismatched major Thalassemia class III with the mean age of 14.28±5.03who underwent transplantation since 1991 to 2014 in Hematology, Oncology and Stem Cell Transplantation Research center,57 patients received co-transplantation of HSCT with mesenchymal stem cells. 8 patients of this group included in our study for liver biopsy after obtaining informed consent form to evaluate the presence of donor-derived epithelial cells and hepatocytes. Five female patients had received transplants from a male donor and three male patients had received transplantion from female donor.Engraftment of hematopoietic stemcell transplantation was verified by cytogenetic analysis. The biopsies were studied for the presence of donor-derivedepithelial cells or hepatocytes usingfluorescence in situ hybridization of interphase nuclei by X and Y centromericprobesand immunohistochemical staining for cytokeratin, CD45 (leukocyte common antigen), and a hepatocyte-specific antigen.

Results

In the present study, all sex-mismatched tissue samples demonstrated donor-derived hepatocyteindependent of donor gender. XY-positive epithelial cells or hepatocytes in female recipientaccounted for 11 to 25 percent of the cells in histologic sections of the biopsy specimens in first follow-up (around 2 years after HSCT) and 47-95% in second follow-up (around 5 years after HSCT) and in male recipient accounted for 4 to 11 percent of the cells in first follow-upand18 to 70 percent in second follow-up.These cells were detected in liver tissue as early as day 743and as late as day 2370 after co-transplantationof peripheralblood withmesenchymal stem cells. The presence of donor cells in the biopsy specimens did not seem to depend on the intensity of tissue damage induced by graft-versus-host disease.

Conclusions

The study has shown that some recipienthepatocytesarereplaced by donor-derived cells. Circulating stem cells can differentiate into mature hepatocytes and epithelial cells of the liver.The origin of these stem cells and the way in which they generate hepatocytes and epithelial cells have not yet been identified. The fate of the donor-derived hepatocyte cell repopulation can only be evaluated using tissue biopsies systematically performed in longitudinal studies.

Ethical priorities in patient selection for HSCT

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Babak Bahar

Many acute leukemia patients and relapsed high grade lymphoma patients need stem cell transplantation and this curative and sophisticated treatment plan should be done timely before relapse of disease.at the other hand many hematologic and not malignant diseases also need stem cell transplantation for cure of their diseases but the pace of their disease is slower and time to relapse can be longer and they can wait more time before stem cell transplantation admit ion. So it seems naturalthat acute leukemic patients have priority right for transplantation ward admit ion in our limited ward space. At the other hand our transplantation centeris a referral center for almost all patients of our country so we have numerous acute leukemic patients waiting for ward admit ion .These leukemic patients at first step have priority right according to informed consent date. Some doctors are inclined to admit younger patients sooner but legally it is not right. Although it seems ethical at first glance but legal aspects are always prior to moral and individualized criteria's for patient selection. Some times one patient has more potential for cure but again it can not be considered as admit ion priorities for ward admit ion. The most applicable criteria for ward admit ion priority istime of informed consent registration in admit ion system. Admition system should be composed of at least three hematologist, expert in stem cell transplantation and a secretariat bureau of one register and one or two personnel for patient follow up before admition.This follow up is not for medical aspects but only for denial registration and refusal of patients for transplantation.Refusal should be registered and signed by the patient if possible or conversation should be recordered

Efficacy of Azithromycin in prophylaxis of acute GVHD following allo-SCT in Hematology- oncology research center of shariati Hospital

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GVHD remains one of the main obstacles to broader application of allogeneic HSCT. GVHD Is Initiated By Donor T Lymphocytes. To Date, Most Therapeutic Approaches Designed To Attenuate GVHD Have Focused On Suppressing Donor T.Cell. However, These Strategies May Increase The Risk Of Relapse And Opportunistic Infections. Azithromycin reduced alloreactive T cell expansion with downregulation of MHC II on dendritic cells. These results demonstrate that preventive administration of azithromycin can reduce the severity of GVHD after allo-HCT. Methods: We performed a double-blind, randomized, placebo-controlled study from October 2013 to August 2014 in the Hematology–Oncology and SCT-RC of Shariati Hospital. In this study we evaluated the efficacy of Azithromycin in prophylaxis of acute GvHD and mucositis in 94 patients with acute leukemia after allogeneic HSCT. The trial was registered at IRCT/ n: IRCT201403281030N16. Patients were randomly assigned to receive either oral Azithromycin at a daily dose of 500 mg or placebo. Azithromycin and placebo was administered as a capsule in similar forms. Medication started six days before BMT and was continued until day +12. Results: acute GVHD Grades 0- II, developed in 43 patients (91.5%) on the azithromycin arm compared with 37 patients (82.2%) on the placebo arm and grades III-IV, developed in 4 patients (8.5%) receiving azithromycin and 8 patients (17.8%) receiving placebo. Although the severity of acute GvHD showed a higher in the placebo group but failed to reach statistically significance (PV:0.281). chronic GVHD, grades 0-1, developed in 25 (61%) and 16 (41%) patients receiving azithromycin and placebo, grades II- III, developed in 16 patients (39%) receiving azithromycin and 23 patients (59%) receiving placebo (PV:0.074). In azithromycin arm oral mucositis, Grade 1 developed in 17 patients (36.2%) Grade 2 in 20 (42.6%) and Grade 3 in 1 patients (2.1%) compared with OM in placebo arm that Grade 1 developed in 21 (44.7%), Grade 2 in 17 (36.2%) and Grade 3 in 7 patients (14.9 %) (pv=0.022). Survival estimates at 1 year of 76.1% and 79.1% for azithromycin and plasebo groups, respectively (Pv=0.67).One-year relapse-free survival estimates for the two groups are 88.5% and 81.2%, respectively (Pv=0.37). Conclusions: There was a statistically insignificant trend to a higher rate of relaps in placebo group compared to azithromycin group. But there was no difference in the overall survival and RFS between the two groups. Within the limitations of the sample size, this study failed to show a significant effect of prophylactic treatment with oral azithromycin in preventing acute GvHD and in improvement of outcome. In summary, our study showed that azithromycin given prophylactically before or early after transplantation significantly decreased Oral mucositis and marginaly significant prevented chronic GVHD in allo HCT recipients.

Keywords: Acute Graft-versus-host disease, Prophylaxis, Allogeneic stem cell transplantation, Oral mucositis, azithromycin

Outcome of hematopoietic stem cell transplantation for relapsed or refractory non Hodgkin lymphoma. single center experience

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Abstract

Introduction:Autologous hematopoietic stem cell transplantation (AHSCT) is the optimal treatment strategy for Non Hodgkin lymphoma (NHL) patients unresponsive to first course of therapy or relapsing after primary treatment . We analyzed our registry data for patients with non Hodgkine lymphoma in Taleghani bone marrow center affiliated to Shahid Beheshti university of medical sciences .**Matherials and methods**:All the patients with NHL who underwent a first autologous HSCT between 1386/6(2007) and 1392/4(2013) were included. Patiens were followed for a mean of three years[minimum 11 months ,max 82 months]Autologous **Results**:HSCT were performed in 45 patients. 14[31.1%] out of them were female and 31[68.9%]male. Mean age was 37.6+/_12.8 years. 60%were in complete remission when 40% were in partial remission at the time of HSCT. The mean time from diagnosis to HSCT was 26.5 +/_ 23.9 months. 71% had received more than two lines of chemotherapy while only 29% received less treatment.Three years Overall survival (3yOS) and event free survival was 70.2% and 59.6% respectively. In patiens in CR three years OS and PFS were 70.4 %and 59.3% in comparison to 68.1% and 59.6% in patient in PR. Patients who received more than two lines of chemotherapy before HSCT had significant worse prognosis[three years OS 44% versus80.6%].Wemen had better survival [three years OS 77.9% versus66.7%] .14 patient [31.1%] passed away ,10 out of them were refractory to autologous HSCT. Disease status at transplantation, disease stage at last relapse , the number of previous chemotherapy courses were prognostic factors. OS was favorable even in patients who underwent autologous HSCT in disease status other than complete remission. **In conclusion**, autologous HSCT is effective and even curative in patients with relapsed and refractory NHL. It is preferred to performed as soon as possible in patients who responded to salvage chemotherapy.

Comparison of Mesenchymal Stem Cells CD Markers in Sheep and Goat fetal Bone Marrow and Mouse Adipose Derived Mesenchymal Stem Cells

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Abstract:

Background: Mesenchymal stem cells (MSCs) have potential of self-renewal and differentiation into many cell types (such as osteocytes, adipocytes and chondrocytes) and can be used for cells therapy. **Objective:** The present study was carried out to isolate and characterize mesenchymal stem cells from sheep and goat fetal bone-marrow and mouse adipose derived MSCs.**Materials and Methods:** Bone marrow MSCs have been isolated from sheep,goat fetal and mMSCs (mouse Mesenchymal stem cells) obtained from Adipose tissue ofsubcutaneousarea using collagenase enzyme**,**then cultured in DMEM:F12 medium supplemented with fetal bovine serum and penicillin and streptomycin. Passaged-3 cells were examined for their potential for the osteogenic and adipogenic differentiationand Surface antigens from isolated cells were analyzed by flow cytometry. **Results:** Bone marrow-MSCs isolated from goat and sheep expressed CD44, CD166 and weak expression of CD34 and CD45 but very weak CD105 and CD90 (for goat: 81%, 98%, 8.44%, 16% 6.8% and 11.3%; for sheep: 99.3%, 96%, 1%, 7.9%, 6.3% and 5% respectively). mMSC were expressed CD markers CD29, CD44, CD34 (84.91%, 87.62% and 26.78% respectively) and CD45 was expressed very weak (1.73%). In three species isolated MSCs, Oil red for adipose cells and alizarin red staining for bone indicated that the cells from all studied groups maintained the differentiation potential into adipose and bone cells. **Conclusion:** Despite the widespread use of MSCs from non-humans, there are no established minimal criteria for the identification of MSCs in non-humans. While all MSCs display plastic adherence and tri-lineage differentiation, not all express the same panel of surface antigens that has been described for human MSCs.

Key words: Bone-marrow mesenchymal stem cells, Adipose derived mesenchymal stem cells, Sheep and Goat fetal, mouse, multi-potential differentiation.

Medical Posters

Expression and purification of recombinant protein containing L1CAM as a cancer stem cells specific marker in Glioblastoma and heat shock protein-70

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Introduction: Glioblastoma is the most common cancer with a high mortality rate in old ages. L1CAM as a cell surface molecule is differentially expressed in Glioblastoma stem cells (GSCs) and plays critical roles in the maintenance, survival and functions of GSCs. Studies have confirmed that vaccination based on L1CAM enhances the cellular and humoral immune responses and inhibits the growth of L1CAM-expressing tumors. So, L1CAM may be a potential target for Glioblastoma immunotherapy. Heat shock protein-70 (HSP70) is a major molecular chaperone, which assists in transport, assembly and folding of proteins in the cytoplasm transmembrane. Previous studies have demonstrated that vaccination with HSP70-peptide complexes elicit specific antitumor responses. These findings suggest that HSP70 is involved in the process of antigen presentation and has potential as an immune-adjuvant chaperone for specific antigens in vaccines.

Materials and methods: The desire recombinant gene based on L1CAM and HSP70 which designed and analyzed by bioinformatics software was chemically synthesized. pET28a were used as an expression vector for transformation of competent BL21(DE3) Escherichia coli. The expression of chimeric multitope in recombinant bacteria induced by Isopropyl β-D-1-thiogalactopyranoside (IPTG). Nickel affinity chromatography were used for purification of chimeric protein. The purified chimeric protein identified and analyzed by SDS-PAGE and Western blotting.

Result: The chimeric gene can clone in prokaryotic system. The expression of the protein corresponding to the predicted size was induced in the presence of IPTG. Recombinant fusion protein was purified by Nickel affinity chromatography. Identification of recombinant fusion protein was performed by SDS-PAGE and Western blotting that confirmed the presence of the chimeric protein.

Discussion: In this study, we presented evidence that human HSP70 enhances the solubility of L1CAM. The chimeric multitope was successfully expressed to a high level in E.coli in soluble form and it is convenient for purification. Following three steps of purification, a purity of greater than 92% of the recombinant fusion protein was obtained. Western blotting

revealed that the recombinant fusion protein obtained via purification had the same immunological characteristics. In conclusion, the present study confirmed the potency of human HSP70 as a molecular immune-adjuvant chaperone and L1CAM for a recombinant protein vaccine, which lays the foundation for the development of vaccines for Glioblastoma and further clinical research.

Key words: L1CAM, HSP70, Glioblastoma, Recombinant protein, Vaccine

In silico analysis of recombinant protein containing L1CAM as a cancer stem cells specific marker in Glioblastoma and heat shock protein-70

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Introduction: Glioblastoma is the most common and lethal type of primary brain tumor. Despite recent therapeutic advances in other cancers, the treatment of Glioblastoma remains ineffective. L1CAM as a cell surface molecule is differentially expressed in Glioblastoma stem cells (GSCs) and plays critical roles in the maintenance, survival and functions of GSCs.

Studies have confirmed that vaccination based on L1CAM enhances the cellular and humoral immune responses and inhibits the growth of L1CAM-expressing tumors. So, L1CAM may be a potential target for Glioblastoma immunotherapy. Heat shock protein-70 (HSP70) is a major molecular chaperone, which assists in transport, assembly and folding of proteins in the cytoplasm transmembrane. Previous studies have demonstrated that vaccination with HSP70-peptide complexes elicit specific antitumor responses. These findings suggest that HSP70 is involved in the process of antigen presentation and has potential as an immune-adjuvant chaperone for specific antigens in vaccines.

Materials and methods: In the present study, we successfully constructed recombinant gene producing chimeric protein based on L1CAM and HSP70 which lays the foundation for the development of a vaccine for Glioblastoma cancer.

We have designed an immunogen complexe consist of L1CAM with overall length genes of HSP70 that represents a three-dimensional epitope of chimeric multitope protein. The construct was analyzed by bioinformatic's softwares. Stability, proper energy level, linear and discontinuous B-cell epitopes, MHC class I and II binding peptides of chimeric protein were predicted.

Result: The designed chimeric moltitope had stability, proper energy level and same immunogenicity as the original protein's epitopes. The chimeric gene can clone in prokaryotic system. Our data indicates that epitopes of the synthetic

chimeric protein could induce both B-cell and T-cell mediated immune responses which are important for a protective vaccine against prostate cancer.

Discussion: Studies have identified a low-expression of L1CAM in normal Glial cells and a high-expression in malignant Glioma stem cells. Further studies demonstrated that the antibody of L1CAM inhibits the Tumor angiogenesis. Many studies have confirmed that vaccination with HSP70-peptide complexes and HSP70-antigen fusion proteins reconstituted in vitro with genetic recombination elicit antitumor immune responses. The present study confirmed the potency of human HSP70 as a molecular chaperone to use as immune-adjuvant for this recombinant protein. Our data may also suggest this synthetic chimeric protein as a vaccine candidate subunit against Glioblastoma.

Key words: L1CAM, HSP70, Glioblastoma, Recombinant protein, Vaccine

The role of tumor necrosis factor-producing mesenchymal stem cells on apoptosis of chronic B-lymphocytic tumor cells resistant to fludarabine-based chemotherapy

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Background and Aims: B-cell chronic lymphocytic leukemia B (B-CLL) is the most common type of leukemia, which is caused by apoptosis deficiency in the body. Adipose tissue-derived mesenchymal stem cells (AD-MSCs) as pro-apoptotic molecules provider such as tumor necrosis factor-related apoptosis-inducing ligand (TRAIL), can consider as an effective anti-cancer therapy candidate. Therefore, in this study we assessed the role of tumor necrosis factor-producing mesenchymal stem cells on apoptosis of B-CLL cells resistant to fludarabine-based chemotherapy.

Materials and Methods: In this study, after isolation and culture AD-MSCs, lentiviral LeGO-iG2-TRAIL-GFP vector containing the gene that produces the ligand pro-apoptotic with plasmid PsPAX2 and PMDG2 virus were transfected into cell-lines to generate T293HEK. Then, T293HEK cell supernatant containing the virus produced after 48 and 72 hours were collected, and these viruses were transduced to reprogram AD-MSCs. Apoptosis rates were separately studied in four groups, including group 1, AD-MSCs-TRAIL; group 2, AD-MSCs-GFP; group 3, AD-MSCs; and group 4, CLL.

Results: The apoptosis rate was observed in group 1, as 42 ± 1.04%; group 2, as 21 ± 0.57%; group 3, as 19± 2.6%; and group 4, as % 0.01 ± 0.01. The highest rate of apoptosis was occurred with group 1 (transduced TRAIL encoding vector). In this group, the average medium-soluble TRAIL was 72.7pg / m and flow cytometry analysis has shown pro-apoptosis rate of 63 ± 1.6% in this group, which was higher than other groups.

Conclusion: In this study we have shown that tumor necrosis factor (TNF) secreted by the AD-MSCs may play an effective role in B-CLL cell apoptosis.

Keywords: B-cell chronic lymphocytic leukemia B (B-CLL) cells; Adipose tissue-derived mesenchymal stem cells (AD-MSCs); Pro-apoptosis rate; Tumor necrosis factor (TNF)

Efficiency of olfactory ensheathing cell transplantation in spinal cord injury tratment

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Introduction

The discussion on the effects and result of olfactory ensheathing cell (OEC) transplantation for the treatment of spinal cord injury (SCI).has residuary unresolved for nearly 19 years and the results of olfactory ensheathing cell transplantation have raised great expectations as a potential treatment for spinal cord injury . This study aimed to evaluate the safety and efficacy of OEC transplantation in chronic SCI patients.

Materials and Methods:

We did a systematic review of studies identified by searching PubMed, Ovide and Elsevier, ProQuest. All studies included efficacy of OEC transplantation in chronic SCI patients also studies were included adverse events of OEC transplantation.

Results

Thirty Studies of patients with chronic SCI treated with OEC transplantation were selected for review. Studies reported their results using the American Spinal Injury Association (ASIA) Impairment Scale; the ASIA motor, light touch, pinprick score and other measure methods . According to the available relevant data, the incidence of total adverse events and mortality were 5.55 % and 0.5 % , respectively. The most frequently reported adverse events were fever, mild anemia, and syringomyelia; however, the statistical detrimental events occurring in different studies were cerebrospinal fluid leakage (5.50 %), sensory deterioration and both motor and sensory deterioration (1.68 %).

Discussion

Given the results from our study, we deduce that OEC transplantation appears to be assured, although the evidence for efficacy is modest and requires the support of futuristic, randomized trials in patients.Further Additional studies are required in order to definitively determine the utility of this type of cellular transplantation for spinal cord injury.

Perfomance of Autologous chondrocyte implantation in microfracture treatment

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Introduction:

Autologous chondrocyte implantation (ACI) is a biomedical treatment that repairs damages in articular cartilage. ACI provides pain relief while at the same time slowing down the progression or considerably delaying partial or total joint replacement (knee replacement) surgery. The goal of ACI is to allow people suffering from articular cartilage damage to return to their old lifestyle; regaining mobility, going back to work and even practicing sports again

Material and Methods:

We did a systematic review of studies identified by searching PubMed, Ovide and Elsevier, ProQuest

Results:

Studies characterized clinical benefit ACI for long-term is very good for microfracture treatment and also those showed repair tissue formed by ACI is as possible.results supported this way is invasive and simpler surgical technique and likewise this method can be useful for microfracture betterment.studies indicated that ACI has not yet been shown to give better clinical outcome than microfracture at short-term or medium-term.

Discussion

clinical benefit ACI for long-term was superior structural outcome in treatment of microfracture with chondrocyte implantation but ACI has not yet been shown to give better clinical outcome than microfracture at short-term or medium-term also it seems fair to conclude that the repair tissue formed by ACI is as good or possible slightly better than a less invasive and simpler surgical technique 1–2 years after the surgery.

Study of proliferation and differentiation of human induced pluripotent stem cells into neurons on electrospun nanofibers

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Introduction: Induced pluripotent stem cells (iPSCs) hold great promise for cell therapies of neurodegenerative diseases and injuries of the nervous system. Human iPSCs, which are functionally similar to embryonic stem (ES) cells, can be obtained from mouse or human fibroblasts by the activation of a limited number of genes such as Oct4, Sox2, Klf4, and c-Myc or by Oct4, Sox2, Nanog, and Lin28. A variety of polymers have been used as scaffolds in tissue engineering. Among them, polyethersulfone (PES) nanofibers can be used in biomedical applications such as hemodialysis, filtration and ultrafiltration due to its positive attributes as a biomaterial.

Materials and Methods: In the present study, nanofibrous PES scaffolds were prepared via electrospinning. Then these nanofibers were treated with oxygen plasma to introduce –COOH groups on the surface, followed by covalent grafting of laminin molecules onto the fiber surface via 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide/Nhydroxysuccinimide solution. Neural differentiation of human iPSCs was evaluated on PES-laminin nanofibrous scaffolds. The effect of laminin grafting and properties of PES were characterized by Fourier transform infrared spectroscopy (FT-IR) and scanning electron microscopy (SEM). Immunocytochemistry (ICC) and quantitative real-time PCR (qPCR) analysis were used to detect the expression of neural genes and proteins.

Results and Discussion: ICC results showed the expression of protein markers including β-tubulin III, MAP-2 and NSE in all of groups but qPCR results indicated that the expression of neural specific genes was increased on plasma treated PES compared with untreated one and on laminin grafted PES scaffolds compared with unmodified one. Whereas the MTT results showed biocompatibility of PES electrospun nanofibers the usage of these modified nanoscaffolds in neural tissue engineering in vivo is promising in the future.

Keywords: Induced pluripotent stem cells, neural differentiation, nanofibrous scaffold, laminin.

A New Protocol for Neural Differentiation of Human Induced Pluripotent Stem Cells

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Introduction: Although embryonic stem cells (ESCs) have enormous potentials due to their pluripotency, their therapeutic use is limited by ethical, biological and safety issues. Compared to ESCs, induced pluripotent stem cells (iPSCs) can be obtained from mouse or human fibroblasts by reprogramming. Numerous studies have established many protocols for differentiation of human iPSCs (hiPSCs) into neural lineages. However, the low differentiation efficiency of such protocols motivates researchers to design new protocols for high yield differentiation. Herein, we compared neural differentiation potential of three induction media for conversion of hiPSCs into neural lineages.

Materials and Methods: In this study, hiPSCs-derived embryoid bodies (EB) were plated on laminin coated dishes and were treated with three induction media including 1) bFGF, EGF 2) RA and 3) forskolin, IBMX. Immunocytochemistry and quantitative real-time PCR (qPCR) were used to detect the expression of neural genes and proteins.

Results: In vitro differentiation of hiPS cells into neuron-like cells was observed in all three defined media. However, morphology of the cells treated with the induction medium 3, containing IBMX and forskolin, was the best. QPCR analyses showed that the expression of neural genes in differentiated hiPSCs in induction medium 3 was significantly higher than undifferentiated cells and those in induction media 1 and 2. Furthermore, expression of the transcription factors including β-tubulin III, MAP-2 and NSE proteins were assayed by immunofluorescent staining which confirmed their presence in hiPSCs differentiated in all induction media.

Discussion: Several studies have revealed that medium supplements are important in iPSC differentiation capacity. In this work, iPSCs were differentiated in the three mentioned induction media for two weeks, and the differentiation rate was examined in the three groups. When the cells were treated with induction medium 3 containing IBMX and forskolin, their morphology had a higher similarity with neuronal cells. On the other hand, this morphological change was more evident in induction medium 3 than other induction media. This might imply that the growth factors and reagents in induction medium 3 enriched the highest percentage of differentiated cells. Immunocytochemistry analyses demonstrated that in induction medium 3, neural specific proteins including β-tubulin III, MAP-2 and NSE were expressed higher than others. These results are in agreement with qPCR data acquired from the differentiated iPSCs. In conclusion, our results indicated the first successful establishment of a new protocol with high yield efficiency for neural differentiation of hiPSCs into neural lineages. Furthermore, we confirmed the influence of induction medium on neural differentiation of hiPSCs.

Keywords: Induced pluripotent stem cells, Protocol, Neural differentiation, Induction media

Study of proliferation and osteogenic differentiation of mesenchymal stem cells on surface modified nanofibrous scaffolds coated with platelet-rich plasma

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Introduction: Tissue engineering seeks to repair or regenerate damaged tissues and organs, without damaging target tissues. Growth factors can support proliferation, differentiation, migration and the expression of genes in human mesenchymal stem cells (MSCs). Platelet-rich plasma (PRP) obtained a source of autologous and it is a great replacement for expensive and allergic methods. Platelet-rich plasma is considered to be a safe source. The aim of this study was to investigate cell attachment, proliferation and differentiation on the surface modified nanofibrous scaffolds coated with platelet-rich plasma for bone tissue engineering.

Materials and Methods: In the present study nanofibrous PLLA were prepared by electrospinning. The surface morphology of scaffolds was characterized using a scanning electron microscope (SEM). Plasma treatment of nanofiber surface was performed. In continue, PLLA nanofibrous scaffolds were coated with platelet-rich plasma. Then, hMSCs were seeded on mentioned nanofibers. Then, proliferation and osteogenic differentiation of hMSCs was investigated. Scaffold toxicity was studied by MTT assay and further, common osteogenic markers such as alkaline phosphatase (ALP) activity and calcium mineral deposition was evaluated in differentiated cells.

Results: Fabricated PLLA nanofibrous scaffolds had a porous structure, bead-free and a uniform, smooth morphology with an average diameter of 100 nm. Surface hydrophilicity of nanofibers was strongly increased after O_2 gas surface treatment because the contact angle was decreased from 120° in plasma untreated nanofibers to the 0° in plasma treated one. In vitro analysis showed that surface modified nanofibrous scaffolds coated with platelet-rich plasma significantly enhanced hMSCs proliferation and osteogenesis. Biocompatibility of the coated and pristine scaffolds were investigated via MTT assay, which revealed the significant increase on the proliferation rate of MSCs cultured on both types of nanoscaffolds. The highest ALP activity was measured on PRP coated scaffolds compared to other groups. As the late osteogenic assessment, calcium deposition was measured in differentiated MSCs on days 14 and 21 of osteogenic induction. Highest mineralization was detected in PRP coated scaffolds compared to other groups.

Discussion: Electrospinning of scaffolds creates 3D structure like of extra cellular matrix (ECM) and plasma treatment of nanofiber surface improves adhesive and differentiation of stem cells. In this study, structure of electrospun scaffolds coated with PRP can ideally mimic the ECM. In conclusion, PLLA electrospun nanofibers coated with PRP could be used as an appropriate scaffold for efficient regeneration of bone defects.

Keywords: Osteogenic Differentiation; Mesenchymal Stem Cells; Platelet-rich Plasma, Nanofibrous Scaffolds.

Synthesis of 58S5 bioactive glass nanoparticles and study of its effect on osteogenic differentiation of mesenchymal stem cells *in vitro*

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The goal of tissue engineering is designing and creating a structure similar to the natural structure of tissue in a living organism in order to repair the damage and tissue lesions. Mesenchymal stem cells are one of the most important stem cells with high self-renewal and differentiation potential. Bioactive glass as a biological material is capable of chemically bonding with soft and hard tissue. These materials subjected to simulated body solution produce hydroxyapatite and can be used in many clinical cases that need production and bone reconstruction. In this study, the effect of 58S5 bioactive glass in the differentiation of mesenchymal stem cells into bone cells was investigated. Studied bioactive glass (64 %, 31 % CaO, 5 % the mole percent) was prepared by Sol-gel method. X-ray diffraction techniques (XRD), infrared spectroscopy (FTIR) and scanning electron microscopy (SEM) were used in order to study phases, chemical groups and morphology respectively. Bioactive glass toxicity was investigated by MTT assay. Finally for detection of differentiation of mesenchymal stem cells to bone cells, the following tests were carried out: Alizarin Red, Alkaline phosphatase activity (ALP), measuring calcium deposits (Calcium content), and phase contrast microscopy. Our results indicated that the use of bioactive glass nanoparticles is able to provide a feasible surface for osteogenic differentiation of hMSCs *in vitro*.

Keywords: Osteoblast Differentiation، Mesenchymal Stem Cells, 58S5 Nanoparticle, Tissue engineering

Effects of different concentrations of Cyclosporin A on ovine fetal mesenchymal stem cells differentiation into cardiomyocytes

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Abstract

Background: Mesenchymal stem cells (MSCs) have potential of self-renewal and differentiation into many cell types and can be used for cells therapy. These cells can also be converted into cardiomyocytes with additional of immunosuppressant drugs.

Objective: The aim of this study was to evaluate the effects of Cyclosporin A on differentiation of sheep fetal bone marrow MSCs to cardiomyocytes.

Materials and Methods: Bone marrow MSCs have been isolated from sheep fetal and cultured in DMEM: F12 medium. Surface antigens from isolated cells were analyzed by flow cytometry. Third passaged cells treated with 0, 150 and 300 µM Cyclosporin A for 14 day then replaced with medium without Cyclosporin A for two weeks.

Results: MSCs expressed CD44 and weak expression of CD34 and CD45. Expression of Gata4, connexin 43, Atrial Natriuretic Peptide (ANP) was also detected by reverse transcriptase polymerase chain reaction and expression of myosin heavy chain (MHY6) and troponin I detected by immunocytochemistry.

Conclusion: This results indicated that addition of Cyclosporin A to culture medium of sheep fetal bone marrow MSCs toward cardiomyocytes differentiation could differentiation of mesenchymal stem cells into cardiomyocytes.

Key words: Cyclosporin A, mesenchymal stem cells, sheep fetal, cardiomyocytes differentiation

Gene expression analysis of pluripotency Genes in cord blood mononuclear cells treated with acidic pH and trituration

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Abstract

Background: induce pluripotent stem cells (hiPSC$_s$) can be obtained from autologous cells for therapeutic purposes. So far, many studies have been done to produce induced pluripotent cells. There are several methods to reprogramming somatic cells including use of small molecules and specific pluripotency proteins. In this study, without transfer of pluripotency factors and genetic manipulation ,and only with pH treatment and trituration separately in cord blood cells the process of reprogramming the gene expression of pluripotency factors OCT4 ،SOX2 ،NANOG ،REX1 ،KLF4 was observed.

Methods: In this experimental study, umbilical cord blood mononuclear cells have been divided into two groups and one of them exposed to HCl (pH 5.7) for 30 minutes and other groups trituration with Hamilton for 10 minutes separately , and then each groups individually have been transferred to the medium that have been supplemented with growth factor bFGF. then RNA was extracted on day7. Quantity gene expression of OCT4 ،SOX2 ،NANOG ،REX1 ،KLF4 was evaluated by Quantitative Real time-PCR.

Results: Gene expression of OCT4 ،SOX2 ،NANOG ،REX1 ،KLF4 were increased after treatment with acidic pH and trituration in 7 days. in comparison with untreated cells.<0.05) P)

Conclusion: Treatment of umbilical cord blood mononuclear cells with acidic pH (5.7) and trituration with Hamilton gage separately, lead to expression pluripotency factors in adult cells. These finding indicate that adult cells may reprogram under changing environmental condition

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Effect of natural and synthetic scaffold on viability and proliferation of differentiated adipose-derived stem cells

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Introduction: Tissue engineering is a multidisciplinary approach which combines biomaterials, cells and growth factors with the aim to obtain organogenesis to repair or replenish damaged tissues and organs. poly(ε caprolactone) (PCL) has attracted considerable interest as a base material for biomedical applications. Also, Curcumin is a natural product found in the rhizome of Curcuma longa being responsible for its biological actions. Curcumin is widely used in tissue engineering and regenerative medicine. The aim of this study was to evaluate curcumin and PCL scaffolds, which might have potential application in growth and viability of chondrocyte differentiated of adipose-derived-stem cells.

Materials (or patients) and methods: Curcumin and PCL was prepared. Adipose-derived stem cells were isolated and cultured in DMEM medium supplemented with 10% FBS. Also ADSCs expanded and characterised by flow cytometry. ADSCs expressed CD44, CD90, CD105 but not CD34. Finally, the scaffold was incubated at 37°C/5% CO_2/99% humidity in differentiation environment. After trypsinization, cells were entered within the curcumin and PCL scaffold. Then, chondrogenic medium was added to the scaffold. 14 days after cell culture, cell viability and proliferation were assessed by MTT test.

Results: proliferation of differentiated ADSCs to chondrogenic cells in two scaffold did not were significantly difference.

Discussion: These results strongly suggested that the curcumin and PCL might have potential application for growth and viability of differentiated adipose-derived stem cells.

Keywords: chondrogenic differentiated adipose-derived stem cells, Curcumin, PCL, MTT assay

The effect of nitric oxide on reductionof proliferation of rat bone marrow mesenchymal stem cells

Saadiye pari

Abstract

Introduction: Sodium nitroprusside (SNP) is a NO-releasing molecules which are used in research and clinical areas. In this study to better understand the role of NO, the effect of different doses of SNP on viability, proliferation of rat bone marrow mesenchymal stem cells (MSCs) were studied. Materials and Methods: MSCs were cultured till the 3rd passage and used to evaluate the proliferation ability in the culture media contaminated with SNP (100 to 2000μM). Viability was assayed with the help of MTT and trypan blue at 1, 5 and 15 hrs. Then 100, 1000 and 2000 μM of SNP as well as 1 hrs was selected for further study. Cell proliferation by colony forming assay (CFA) and population doubling number (PDN), the morphology of the cells by fluorescent staining were measured. Then the data was analyzed statistically using ANOVA, Tukey test; and $p<0.05$ was taken as the level of significant. Results: the results showed that the viability of the MSCs reduced from 750 μM at 1 hrs and 250 μM at 5 and 15 hrs with a dose dependent manner. The 100 μM caused reduction of cytoplasm area at 5 and 15 hrs as well as mean number of the colony at 7 and 14 days. On the other hand, nuclear diameter, cytoplasm area, mean number and diameter of the colonies were decreased significantly due to treatment with 1000 and 2000 μM. Conclusion: high dose of SNP showed reduction of cell viability and proliferation due to cell metabolic imbalance, cell infrastructure alteration.

Key words: mesenchymal stem cells, sodium nitroprusside, morphology, viability.

Evaluation of effect of nanofiber MWCNT/gelatin/PLA scaffold on differentiation of bone marrow stem cells into neuron like cells

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To find a suitable scaffold for nerve tissue engineering, we studied the influence of a composite scaffold with base of polylactic acid (PLA) coated with multi-wall Carbon nanotube (MWCNT) and gelatin on neuronal stem cells behavior . In this study, PLA scaffolds fabricated by wet electrospinning method followed by dissolving 15% w/v PLA polymer in chloroform. Then, this scaffold was coated with 1mg/ml MWCNT and 1mg/ml gelatin (GE) via self-assembly method. Afterward, the morphology and biocompatibility of scaffolds characterized by SEM and MTT assay, respectively. Also, the hydrophilicity and mechanical strength of this scaffold was evaluated. In the following step, bone marrow stem cells isolated from rat long bone, cultured in DMEM/F12 supplemented with10% (v/v) FBS, 100 unit/ml of penicillin and 100mg/ml of streptomycin in a humidified incubator at 37 °C with 5% CO_2 and expanded for several passages. Passage 3 of BMSCs differentiated into neuronal stem cell (NSCs), in first step. Then, NSCs were seeded on scaffolds and cultured in DMEM/F12 supplemented with 5% (v/v) FBS, 30 μM retinoic acid (RA) for 7 days.
Finally, neuron like cells identified by immunocytochemistry assay that we used nestin, NF68, NF200 and MAP2. The expression of nestin, MAP2 and NF200 genes detected by means of RT-PCR. Consequently, we found that MECNT/GE/PLA scaffold is an ideal substrate rather than pure PLA or GE/PLA for differentiating of multipotent BMSCs into neuron-like cells that because of presence of carbon nanotube as a conductive polymer in the scaffolds.

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Title: Reduced apoptosis of neural stem cells using nanoparticle SPION

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Abstract:

Nowadays brain and spinal cord injuries is common disorders. Recent reports indicate an improvement was noticed using neural stem cell transplantation because these cells are able to differentiate into various types of cells in the central nervous system, including neurons, astrocytes and oligodendrocytes. But apoptosis is a common problem of transplantation. Superparamagnetic Iron Oxide Nanoparticles (SPIONs) can be easily internalized into the cells. They can be used in the fields of Biomedicine, cell tracking and gene transfere and others .
In this study, bone marrow mesenchymal stem cells were islated from rats femur and cultured in the DMEM medium with 10% FBS. After 4 passages,flow cytometry confirmed the property of the cells.They were cultured in DMEM medium supplemented with B27, bFGF and EGF in order to generate the neurospheres, then they harvested and cultured in neurosphere medium with 5% FBS in order to produce neural stem cells. The later was characterized by immunocytochemical techniques.They were cultured at different durations (24, 48 and 72 hours) in a medium containing uncoated SPIONs and coated with poly-L-lysine. The entry of SPIONs into the cells was confirmed with Prussian Blue stain. Determination of apoptosis was performed by Anexin-PI kit and RT-PCR. Statistical analysis showed that apoptosis was significantly higher in the uncoated SPIONs as compared with coated SPIONs with PLL.

Abstract:

Ntan1 gene expression in neural stem cells tranfected with SPIONs

Hoda Akbari, Sadegh Ghorbani, Taki Tiraihi*, Shahram Pour Beiranvand,Hosein Naderimanesh

Living organisms are continuously exposed to the natural geomagnetic fields of Earth. Recent reports on mouse indicate an increase exprression of Ntan1 gene in all tissues but relatively abundant in brain, retina and testis that it is related to the time and intensity of magnets. Ntan1 is originally identified as the enzyme that it is considered to be an essential component of a protein degradation signal that destabilize the N-Terminal of a protein. Superparamagnetic Iron Oxide Nanoparticles (SPIONs) can be easily internalized into the cells. They can be used in the fields of Biomedicine, cell tracking and gene transfere and others .
In this study, bone marrow mesenchymal stem cells were islated from rats femur and cultured in the DMEM medium with 10% FBS. After 4 passages,flow cytometry confirmed the property of the cells.They were cultured in DMEM medium supplemented with B27, bFGF and EGF in order to generate the neurospheres, then they harvested and cultured in neurosphere medium with 5% FBS in order to produce neural stem cells. The later was characterized by immunocytochemical techniques.They were cultured at different durations (24, 48 and 72 hours) in a medium containing uncoated SPIONs and coated with poly-L-lysine. Determination of Ntan1 gene expression was performed by RT-PCR. Statistical analysis showed that Ntan1 gene expression was significantly higher in with coated SPIONs with PLL at 72 hours as compared the uncoated SPIONs and other durations.

Abstract:

Investigation about optimization culture medium for differentiation of human adipose stem cells to human epithelial like stem cells

Zeinab Najafi, Taki Tiraihi*, Shahram Pour Beiranvand, Masoud Soleimani

epithelial stem cells can be used for wound healing, burns, scar tissue of old wounds, etc. In this study, compared two types of mediums to differentiate the human adipose stem cells into human epithelial like stem cells.so that, human adipose stem cells isolated from fat tissue of patients who has Cosmetic surgery,using collagenase type 1. After 4 passage, flow cytometry confirmed the property of the cells. Cells were divided into 3 groups: first group containing control group with normal DMEM,second and third group containing low glucose DMEM one with containing retinoic acid and the other with retinoic acid plus growth factors EGF and bFGF, then cells were cultured for 14 days. All three groups were compared morphologically by inverted optical microscope. The gene expression of cytokeratin PAN, 14 and 18 chek with immonocitochemistry and gene expression of cytokeratin 10.14 and 18 were examined by RT-PCR at day 7 and 14. Results showed that the morphologically of differentiated cells in second groupas were Polygonal shape and the third group was elongated. Cytokeratin expression in each two days and two experimental groups, in each immonocitochemistry and RT-PCR confirmed diffrentiatin but the expression of second group without growth factor expression was better than other, while the control group don't have any expression. as a result, retinoic acid as the main distinction in the category epithelial stem cells and the use of growth factors isn't necessary. Growyh factor only accelerate and shorten the time period of differentiation.

Title: Wound healing with using of nanofiber PLA scaffold

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Abstract:

Skin is the largest organ in body that consider as a first barrier against toxins and microorganisms in the environment. Injury of this tissue mainly causes infection in local and distributes to whole the body with blood circulation. During the last decade, a number of researches done about all type of wound healing. In this study, we used tissue engineering method for treatment of wound. For this purpose, first we fabricated and characterized nanofiber polylactic acid (PLA) scaffolds with electrospinning technique. In the next step, bone marrow stem cells isolated from femur bone of rat, seeded on the scaffolds. Then, wound models were formed through remove of full thickness of skin with 2cm round diameter on the back of rats. In this research, we investigated four groups with PLA pure scaffolds, PLA scaffolds with seeded stem cells, Hemofoam (ChitoTech Inc, Iran) as a control dressing and a control group without any dressing. In 7, 14 and 21 days, we monitored process of wound healing. In conclusion, by means of H&E and Masson's trichrome staining and detection of keratin 10 (Krt10), keratin 14 (KRT14) and involucrin (IVL) genes by RT-PCR, we fund that the PLA scaffold group with bone marrow stem cells indicated best result rather than Hemofoam and pure PLA scaffold during repair of wound, respectively. We suppose that high porosity of this non-woven scaffold that lets cell migration and appropriate transport nutrient elements to cells lead to these good results.

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Cord Blood Banking for Transplantation and Regenerative Medicine

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Collection and banking of umbilical cord blood can provide a virtually unlimited source of ethnically diverse stem cell donors.

The main limitation factor for use of umbilical cord blood units (UCBs) as a source of hematopoietic progenitors for transplantation is cell dose. The engraftment outcome of UCB transplantation is highly dependent on nucleated cell number of unites. It would be useful to predict CB cell content using information of donor-related variables before cell processing.

Banked unrelated donor umbilical cord blood (CB) has improved access to hematopoietic stem cell transplantation for patients without a suitably matched donor. In a resource-limited environment, ensuring that the public inventory is enriched with high-quality cord blood units (CBUs) addressing the needs of a diverse group of patients is a priority. Identification of donor characteristics correlating with higher CBU quality could guide operational strategies to increase the yield of banked high-quality CBUs.

In contrast family-directed CB collection and storage which requires different procedures in order to obtain high-quality products. This approach is clinically indicated and validated in families where the mother is pregnant and has an existing child or has a known risk of having a child affected by a disease which can be cured by allogeneic HSCT. The engraftment outcome of UCB transplantation is highly dependent on nucleated cell number of unites. It would be useful to predict CB cell content using information of donor-related variables before cell processing.

In this study, CBs were obtained from 2865 single-birth term deliveries in 3 hospitals affiliated to Tehran University of medical sciences from January 1998 to June 2013. Up to August 2013, 54 units have been used in transplantation for patients with malignant and non-malignant disorders.

The attempt has been made to find factors which have significant effects on quality of cord blood units, including cord blood volume, TNCs, and CD34+ cell counts.

The role of PDGF as a main Platelet alpha granules growth factors for the expansion of human mesenchymal stem cells

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Background

Mesenchymal stromal cells are employed in various different clinical settings in order to modulate immune response. Human autologous and allogenic supplements, including platelet derivatives like platelet lysate and platelet-released factors and serum, are assessed in clinical studies to replace fetal bovin serum . The immunosuppressive activity and multipotential characteristic of MSCs appears to be maintained when the cells are expanded in platelet derivatives.

Material& Methods

We tested the ability of a different concentration of platelet lysate-supplemented medium to support isolation and *ex vivo* expansion of Wharton jelly derived mesenchymal stromal cells.We also investigated the biological/functional properties of mesenchymal stromal cells expanded in presence of platelet lysat , in comparison with mesenchymal stromal cells supplemented with 10% FBS. Also we attempt was made to study the expression of Colagen I and II aggrican and SOX9 in presence of different concentration of growth factors.For investigation effect of plattlet lysat on chromosomal stability the conventional.

Results

We observed 5 and 10% PL caused greater proliferation of MSC effects .These cells exhibited typical morphology, immunophenotype and differentiation capacity. The genetic stability of these cells from umbilical cord blood was demonstrated by a normal karyotype. In addition Also the results of real-time PCR analysis showed that the expression of cartilage specific genes were higher in mesenchymal stromal cell in presence of 5 and 10% PL as compare with FBS supplement.

Conclusions

In conclusion,we demonstrated that PL from cord blood could be used as a alternative source of growth factors for expansion of hMSC and also maintained similar growing potential and phenotype without any effect on chromosomal stability.

Key words: mesenchymal stromal cells, umbilical cord blood, platelet lysate, immunomodulatory properties, cell therapy.

The role of Minor histocompatibility antigen mismatching in Acute Graft-Versus-Host Disease After Hematopoietic Stem Cell Transplantation

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Bakground : It is suggested that HA-1 mismatching among hematopoietic stem cell transplanted recipients-donors is associated with acute graft-versus-host disease (aGVHD) . So the aim of this study was to examine the correlation between HA-1 disparity and GVHD patients who received transplantation from a HLA-identical sibling .

Samples and Methods : DNA were extracted from 55 pairs of HLA-A2-positive recipients-donors . HA-1 was detected by SSP-PCR method (mHag primer set kit) .

Results : Our results showed: HA-1 disparity was detected in 8 out of the 55 donor/recipient pairs (14.5%) . aGVHD (grades II-IV) was occurred in 6 (75%) out of 8 patients with HA-1 disparity .

Conclusion : we coud not find any significant relation ship between HA-1 disparity and risk of acute GVHD .

The role of platelet contenterationduringPBSCs cryopreservation in cell aggrigation

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Background:
peripheral blood may be harvested to provide hematopoietic stem cells (HSC) for autologous transplantation. After collection, the harvested cells usually undergo several processing steps to reduce the product volume, remove cells and to cryopreserve the cells for later reinfusion.
One the major problem during cryopreservation and thawing process of stem cells is formation of clot and cell aggrigation due to activation of platlet . In recent investigations have been shown that certain HES solutions (depending on the molecular weight of the starch, or possibly on the degree of substitution) could activate the fibrinogen binding sites (glycoprotein IIb–IIIa) on the platelet surface . HES has been reported to compromise overall platelet function as measured by platelet aggregometry.

Methods:
PBPCs werecollected from 20 consecutive patients planned for highdosechemotherapy with stem cell rescue for peripheral blood stem cell harvesting and cryopreservation.All patients received initial disease-stabilizing chemotherapy,and PBPCs were thereafter mobilized by chemotherapycombined with subcutaneous granulocyte colony stimulating factor (G-CSF). The collected stem cells were mixed with HES (1:4) for 60-45min to deplete the RBC content. Supernatant was collected in transfer bag and PRP was separated with centrifugation (2000g for 3min).The PBPC cry bagswith %10 DMSO concentrations were frozen from astarting temperature of 4 to °160-C in a controlled programmedfreezer

Result:
The attempts have been made to investigate the possible effect on separation of PRP from collected peripheral blood stem cell could reduce the platelet content up to %70 and subsequently which lead to reduce or eliminate the risk of clot formation and cell aggregation during cryopreservation process.

Conclusion:
Our finding showed the formation of clot and cell aggregation due to effect of HES on platelet activation or other mechanisms could be eliminated by reduction of platelet content which help to increase the quality and quantity of cryopreserved stem cell ,

Nursing Oral Presentations

REPORT ON NURSING CARE IN ADULT BMT UNITS

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Introduction & Aims: Nursing role to patients problems before and after transplantation due to psychological and organic aspects, Chemotherapy (CT) and its side effects Care of central venous access, timing and features of GVHD, and its follow up, transfusion, vital signs, intake- out put and electrolyte balance and nutrition is very important. In this isolated ward, nurse›s role to evaluate economical, cultural and psychological state of patients and to coordinate them with physician is also important. Conditioning regimens administered before transplantation to make enough space for cells and to suppress the immunity of patients.

Materials & Methods:

Patients with diagnosis of AML, ALL, CML, Myeloma, Lymphoma, aplastic Anemia and thalassemia major, allogeneic or autologous stem cell transplantation was done.

Finding:

According to nursing cares, problems with central venous catheter (e.g. Infection), side effects of CT (hemorrhagic cystitis, cardiac and pulmonary problems), problems due to transfusion, noutropenic problems (infections, diarrhea and fever), GVHD and psychological problems, diminished in patients before and after discharge.

Conclusion:

To develop nursing cares has major role in diminishing side effects of stem cell transplantation.

Caring for the Patient with Cancer at Home: A Guide for Patients and Families

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This guide gives general information about caring for someone with cancer at home. It's an ABC list of the common problems people with cancer have (such: Anemia, Changes in Appetite, changes in Blood counts, Constipation, Diarrhea, Exercise, Fatigue, Fever, Hair loss, Infection, Mouth, bleeding, Mouth dryness, Mouth sores, Nausea and vomiting, Pain, Skin dryness, Sleep problems, Weakness, Weight changes).

It gives signs of Problems to watch for and ideas for what we can do if problems come up. The cancer-care continuum is a useful paradigm for planning and testing interventions that improve clinical outcomes and enhance patients' quality of life (QOL). However, paradigms do not change easily, especially paradigms in which providers have historically told patients what to do and expect patients to follow their orders.

In this paper we explore self-management (SM) as a model of cancer care that involves providers forming partnerships with patients and families. These partnerships enable and empower patients and families to achieve their own goals of care - at all phases along the cancer-care continuum.

Sexuality Information Needs of Patients with Cancer

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Most people with cancer do manage to return to dealing with normal life issues. One of these is sexual functioning. Cancer diagnosis and treatments may have significant on sexual activity, from functional, to emotional and mental effects. While sexuality is an important aspect of human health and quality of life, research indicated that nurses ignore it for a variety of reasons.

Sexuality is an integral part of normal life for most individuals and is an important aspect of quality of life. Sexuality includes feelings about one's body, the need for touch, interest in sexual activity, communication of one's needs to a partner, and the ability to engage in satisfying sexual activities. As individuals with cancer live longer, sexual issues become increasingly more important, and health care providers must be prepared to assess problems in this area and to provide anticipatory guidance related to treatment and the resumption of sexual activity.

Because sexual function is one important aspect of quality of life, it is important for health care providers to find out if a patient is experiencing sexual problems. Nevertheless, sexual counseling is not routinely provided in most oncology treatment settings. Available information indicates that patients are not routinely questioned about sexual practices, and little teaching or counseling is provided. Good communication skills are essential. Incorporating sexual history taking and counseling needs to become a part of standard medical education at all levels of training. Talking about sexuality may be perceived as a large barrier that is difficult to overcome; however, there are some relatively simple strategies to include this as part of clinical care.

The report about Hematopoietic Stem Cell Transplantation Center

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In the spring of 1384 of Iranian calendar or 2005 Christian calendar the idea and plan of founding a Hematopoietic Stem Cell Transplantation (HSCT) center in Valie-Asr hospital just like one of the HSCT wards of Shariaty HSCT center proposed by Dr.Safaee,one of the

PHD of Hematology, and the proposal was accepted by Dr. Sharifian,the head of the

Hematology & Oncology center of Valie-Asr Hospital and was agreed by Dr. Ghavamzade

,the head of the BMT& HSCT of Shariaty.

In the summer of 2006 the HSCT center was inaugurated by some authorities and in the presence of aforementioned masters.

the Center consists of two parts; A 6-bed ward for hospitalizing patients and a laboratory for

harvesting, preparing and counting stem cells. About 400 cases of HSCT have been done in the center by now. The patients suffering from AML/ALL MULTIPLE MYELOMA/

HODGKIN'S Disease/ LYMPHOMA/ APLASTIC ANEMIA have undergone transplantation so far.

Pediatric Hematopoietic Stem Cell Transplantation Nursing Care in Shariati Hospital

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Introduction: Hematopoietic stem cell transplantation (HSCT) is curative treatment in many malignant and non-malignant diseases. The Hematology-Oncology Research Center and Stem Cell was founded in 1991 our country in shariati hospital. Since 2007 one of HSCT wards specialized to children less than 15 years which named Pediatrics HSCT ward. It had 7 active beds at first, now has 11 beds. From the first days of its activity, it was possible to perform transplantation of all the Malignant and non-malignant hematologic diseases, Primary Immunodeficiencies, Metabolic diseases and Solid tumors. Pediatric SCT ward is also involved in the research activities aimed at improving the diagnosis and management of different pediatric diseases.

Patients and method: All patients were cared for in single isolated rooms equipped with high efficiency particulate air (HEPA) filters and received irradiated blood products. Antimicrobial prophylaxis included Acyclovir, Trimethopim–Sulfamethoxazole and Itraconazole were also administered to prevent CMV, Herpes simplex, varicella zoster, Pneumocystis jiroveci and fungal infections, respectively. Conditioning Regimens was given prior to stem cell infusion mainly according to and patients' disease and transplant center protocols. Busulfan/cyclophosphamide has been the most conditioning regimen used. All patients candided for Allo-HSCT received graft-versus-host disease (GvHD) prophylaxis regimen. Neutropenic fever was treated with broad-spectrum intravenous antibiotics.

Results: The most common indications for allogeneic HSCT were thalassemia, acute myeloid leukaemia and acute lymphoblastic leukaemia. Most patients who underwent autologous HSCT were diagnosed with AML and Neuroblastoma. The youngest patient who underwent HSCT was less than 4 months. The most complications of HSCT in our patients were GvHD and infection. Relapse was most common cause of failure. At the time of writing, among one to 271 months after HSCT, %71.2 patients are still alive and disease free.

Conclusion: HSCT which is associated with significant morbidity and mortality, is only curative therapy for many malignant and nonmalignant diseases in pediatric. Patients undergoing HSCT, particularly those suffering graft-versus-host disease or infection, require more nursing care. Pediatric HSCT has been successfully adapted to routine clinical care in Iran.

Improving Quality of life in patients with cancer

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Introduction: Quality of life (QOL) is a difficult concept to define and to measure. The term QOL extends not only to the impact of treatment and side effects, but to recognition of the patient as an individual, and as a whole person, body, mind and spirit and need to whole care. As if holistic care encompasses the concepts and domains of physical (functional), social, psychological and spiritual care with the aim of preventing and reliving suffering and improving quality of life for patient with life-threatening illness such as cancer and their families. This study is aimed to assess the all of dimensions quality of life in cancer patients.

Materials and Methods: A systematic review was performed by searching medical databases (Medlib, SID, Magiran and for potentially relevant studies that appeared between January 2000 and December 2015.) Iran Research Information Base Studies were included if they addressed the question of how quality of life is improved in cancer patients. So the content of the standard of care in each dimension quality of life and care guide in each domain in the number 326 articles was .assessed

Results: The findings revealed that 20.5% of articles had attention to all aspects of the comprehensive care needs, but most of the quantitative data was about physical symptoms by 39% and then 26% psychological, which is consistent with studies in other countries. But dimension social support and spiritual care at the lowest data rate respectively 8.3% and 4.9% was.

Discussion: the studies confirm that spiritual care is associated with patients' satisfaction with care and improve QOL. Therefore, we need attention to all aspects of QOL particularly spiritual and social support through the development of standard content and national guidelines based on religious and cultural values for guiding care providers.

Diet after Bone Marrow Stem Cell Transplant

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Introduction: Bone marrow transplantation (BMT) is a treatment which often results in nutritional complications. Common conditions affecting dietary intake are mucosal membrane injuries, nausea, vomiting and anorexia. Although the patient must follow strict dietary restrictions, it is also extremely important to eat well after transplant. With the aim of improving clinical outcomes and quality of life, dietary advice is therefore a necessary part of treatment. The aim of this stu`dy was review appropriate diet after BMT.
Materials and methods: In this study the results of 15 researches about diet after BMT was reviewed. One systematic review, two randomized control trial, two descriptive study, two cross- sectional study and seven overviews were studied.

Results: The result of review showed that the optimal diet for cancer patients and survivors emphasizes fruits and vegetables, whole grains, legumes, foods rich in healthy fats like omega3- and monounsaturated fats and lean protein sources. Getting enough calories, protein and fluids into body can be difficult, particularly during the first few weeks after transplant. Initially well-nourished patients may require total parented nutrition (TPN) during the whole period in hospital. Lipid emulsions have become an important constituent in total parenteral nutrition (TPN) regimens. The first well-tolerated emulsions were made of soybean or safflower oils or of mixture of both and contained exclusively long-chain triglycerides (LCT). There are two types of Intravenous lipid emulsions (ILE) in general use at present. The first ILEs were soya based; these consist of long-chain triglycerides (LCT) and have a greater proportion of polyunsaturated fatty acids (PUFA) than monounsaturated fatty acids (MUFA). A new olive oil-based lipid emulsion (ClinOleic) consisting of purified olive oil (%80) and soybean oil (%20), and containing only LCTs, has been devised as named ClinOleic. It may be used as a safe alternative to standard soybean-oil based lipid emulsions. The OO-based emulsion (ClinOleic) was well tolerated in critically ill neonates. Also, epidemiological studies suggest that olive oil exerts a protective effect against certain malignant tumors.
Oral supplementation is also a simple, non-invasive method of increasing the nutrient intake of those patients who are unable to meet nutritional requirements, despite dietary counselling. Enteral tube feeding is indicated for patients who are unable to meet their nutritional needs by oral intake alone, and has been shown to improve clinical outcomes. Novel approaches in oral supplementation include the use of eicosapentaenoic acid (EPA), a compound under investigation for its role in preventing and treating cancer-associated malnutrition. Individual studies suggest that EPA attenuates cancer-associated wasting and improves immune function. In addition, it has been shown to have anti-tumor effects and improve clinical outcomes. In Autogenic transplant guidelines, Patients at home need to avoid some foods for 30 days post-transplant. For example: Raw or undercooked meat, Poultry, Fish, Eggs, Hot dogs, Sausage, Tofu.

Conclusion: The right diet is a key to success of the transplant. Stem cell transplantation carries specific dietary requirements in order to successfully regenerate the immune system. Following the dietary restrictions and working closely with a dietitian will help the patient meet his/her daily needs.

Key words: BMT, diet, nutritional needs

Physical Activity and Rehabilitation in cancer

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Introduction

Physical activity and rehabilitation are very important in patients that suffer from cancer and treatment**.** Oncology rehabilitation describes a wide range of therapies designed to help patient build strength and endurance, regain independence, reduce stress and maintain the energy. Daily activities and exercise are very important to cancer patients.

Content

Adults should get at least 150 minutes of moderate intensity or 75 minutes of vigorous intensity activity each week (or a combination of these), preferably spread throughout the week. Children and teens should get at least 1 hour of moderate or vigorous intensity activity each day, with vigorous activity on at least 3 days each week.

Lifestyle changes and advances in technology have led to people being less active and spending more time sitting each day. This is true both in the workplace and at home, due to increased TV, computer, and other screen time. Limiting the amount of time spent sitting, as suggested in the table below, may help maintain a healthy body weight and reduce the risk of certain cancer.

Physical activity may reduce the risk of several types of cancer:

- Breast
- Colon
- Endometrium (lining of the uterus)
- Prostate (advanced cancers)

The risk of other cancers may be lowered as well, although the evidence is limited.

A physically active lifestyle may also lower a person's risk of other health problems such as heart disease, high blood pressure, diabetes, and osteoporosis (bone thinning).

Being active may also help to prevent weight gain and obesity, which may in turn reduce the risk of developing cancers that have been linked to excess body weight.

Rehabilitation often helps patients regain strength, physical functioning, and independence that they may have lost due to cancer or its treatment.

Rehabilitation can improve the quality of life for people with cancer by reaching the following goals:

- Improving physical strength to help offset limitations caused by cancer and cancer treatment
- Increasing a person's ability to care for himself or herself and reducing support needed from caregivers

- Providing support to adjust to actual, perceived, and potential losses due to cancer and cancer treatment
- Managing symptoms of cancer and its treatment, including fatigue, sleep problems, and pain.

.**Results**

After cancer treatment, patients may notice a difference in their physical, social, psychological, and work-related abilities. Cancer rehabilitation helps a person with cancer regain and improve the abilities that may have changed after cancer treatment. The goal of rehabilitation is to help a person remain as independent and productive as possible

Psychological and Spiritual Support in Patients with Cancer and Their Families

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Nowadays, cancer is one of the most important global health problems. Approximately 1.6 million new cases of cancer are expected to be diagnosed in the United States in 2015. According to estimation of the World Health Organization (WHO) it will be the cause of 13.1 million deaths every year in the world until 2030, if its prevalence continues to increase. Diagnosis of cancer causes emotional, behavioral and psychological problems in both patients and their families also it will leave a heavy economic and social costs and burden on both families and society. Some studies have been shown that 50-85% of patients that suffering from cancer involved in psychological distress at the same time.

The patients diagnosed with cancer experience heightened spiritual and psychological distress that involve them with significant levels of symptoms which make successful coping with cancer-related stressors more difficult.The most important reasons are; sudden symptoms onset, uncertainty about the future, changes in body image, diminished self-esteem, decision-making difficulties, loss of their attractiveness, feeling of isolation due to lose of their situation on the family and society, fear of recurrence or death. Families of cancer patients are also affected by the disease of their loved ones, often experiencing emotional distress, shifting of roles, financial burden, caregiver distress, and fear of losing their loved one, all of which can change their lives significantly.

Psychological support is an integral part of cancer care. It help patients and their families acquired new skills to cope with current stressors and use to increase coping self- efficacy (i.e. confidence in the ability to cope with cancer) that can give them more authority face to future with less problems. In fact coping self-efficacy has been demonstrated to be associated with

improving cancer- related outcomes such as reduced psychological signs distress.

Some psychological approaches are; training relaxation, guided imaginary, meditation, stress management strategies (ie; adaptive coping, interpersonal conflict resolution skills, problem solving and healthy life style targeted attention to healthy nutrition and sleep health), talking therapy(express feeling by talking), expressive writing interventions (write down fears and emotions), spiritual support through prayer.

The patients' families Attitudes toward telling truth to cancer patients in Iran

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Introduction

telling cancer patients the truth is controversial. The aim of this study, a review of research related to truth-telling in the family of cancer patients in Iran

Method: The study included articles published in Iran on patients' families attitudes toward telling truth to cancer patients. In the present study data extracted from articles published in several databases such as PubMed, ScienceDirect, Scientific Information Database (SID), Magiran, Iran Medex, Google Scholar with key terms such as truth disclosure, breaking bad news, awareness of death , patients' families without any time restriction

Results: A total of 5 articles were selected and reviewed**.** the results showed that despite the willingness of patients, The patients' families are not willing to provide information about the disease to the patients.

Conclusion: Despite making secret atmosphere in the family, The role of patients' families in treatment decisions is important and facilitators.

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Pregnancy after Cancer

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Abstract

In general, becoming pregnant after cancer treatment is considered safe for both the mother and the baby, and pregnancy does not appear to raise the risk of cancer recurring. However, women may still be advised to wait a number of years before trying to become pregnant. The amount of time depends on the type and stage of cancer, the type of treatment the woman received, and the woman's age and preferences.

Some doctors recommend that women not get pregnant within the first six months after finishing chemotherapy because any eggs that may have been damaged by treatment are thought to leave the body within this time period. Other doctors recommend waiting at least two to five years because that is the window of time in which a cancer is most likely to recur and/or the time needed to receive optimal treatment for some types of cancer, such as hormone-sensitive breast cancer.

The type of treatment a woman receives has a number of potential effects on a pregnancy. Some cancer treatments can increase a woman's risk of miscarriage (losing a pregnancy) as well as labor and birth complications.

- Radiation therapy to the uterus may increase the risk of miscarriage, premature birth, and low birth weight.
- Surgical removal of all or part of the cervix may increase the risk of miscarriage or early delivery.
- Radiation therapy to the whole abdomen, pelvis, lower spine, or to the entire body may increase the risk of miscarriage, early delivery, or other problems.

Other concerns:

1-Risk of children getting cancer

2-Risk of cancer recurrence

3-Coping with uncertainty

4-Infertility

Report of Mashhad B.M.T unit

Bakhti O, Ghassemi A

Abstract

Mashhhad Bone Marrow transplantation center that is the only ward in the east of Iran. The activity started from 2011 with 5 isolation rooms. During these four years, 34 patients were hospitalized in this unit. The average age of our patients was 9.5 years (1-27), which 62.5% of cases were males and 37.5% were females. Our patients were All (8cases), Aml (4 cases), Aplastic Anemia (4 cases), Fancony Anemia (2 cases), sickle cell anemia (2 cases), NHL (2 cases), Noroblastoma (3 cases), Thalasemia (2 cases), Hepatoblastoma (1 case), Willms tumor (1 cases), CGD (1 case), SCID (1 case), Osteopetrosis (1case), HLH (1 case).The kind of B.M transplantations include allogeneic (78%) and autologous (22%). Resources of stem cell was from different patients; 90% from peripheral (Pbsct), 6% from bone marrow and 3% from cord blood. The average duration of hospitalization of our patients was about 33 days and the mean time for recovery of neutropenia was about 18 and for trombocitopenia was about 13 days. 77% of our patients don't have relapse and 78% of all cases are still alive. The causes of death were relapse (%9.4), GVHD (6.3%) and other complications (6.3%). The 77% of donors were siblings and 7% related and 7.4% other – related. Among 7 cases with GVHD, 2 of them were sever ad in stage IV that led to death.

Report of nursing care processes in hematopoietic stem cell transplantation center in Amirkola hospital of Babol

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Materials and methods: Hematopoietic stem cell transplantation center in Amirkola hospital of Babol from September 2010 has started with 2 doctors , 9 nurses and 4 inpatient beds.The result of the efforts of doctors and nurses in this center during the past 5 years, 90 patients with malignant and non-malignant diseases under hematopoietic stem cell transplantation was performed.Critical to the success of any hematopoietic stem cell transplantation program is an outstanding cadre of well-trained and compassionate nurses.we are honored to have such a group here at hematopoietic stem cell transplantation center in Amirkola hospital of Babol, many of whom have been with us since the inception of the program in 2010

Results: Hematopoietic stem celltransplantation (HSCT)nurses are distinguished by their dedication, outstanding clinical skills and, most important, their humanism that helps our patients through the most challenging times in their lives. In addition to their clinical care at the bedside,our nurses provide important coordination in the complex care required of the transplant patient, as well as in the conduct of research studies .A particular aspect of our program is a collaborative, team-based approach that brings the expertise of all individuals together for the best possible care of our patients. Each day, the HSCT nurse presents the patient to the team. The patient's status, current treatments, acute and chronic issues are all addressed.A mutual respect characterizes relationships between the physicians and the nurses, and physicians are often heard commenting on the dedication and importance of nurses in the HSCT program.

Discussion: Due to the vital role of nurses trained in the care of transplant patients, assessment and management of various problems HSCT nurses is recommended. with a better understanding of the problems,HSCT nurses can actively work in the care of transplant patients to achieve desired results.

Keywords: nursing, hematopoietic stem cell transplantation,hospital

Nursing management in oncologic emergencies

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Introduction: As there has been an increasing incidence of cancer —due to an aging population and changing lifestyle— there is a significant need for nurses to recognize, assess and intervene when encountering with oncologic emergencies. An oncologic emergency is an acute, potentially life threatening condition in a cancer patient resulting from a structural or metabolic change that has developed as a result of cancer or its treatment.

Materials and Methods: This paper is aimed at reviewing the literature on nursing management of oncological emergencies. A comprehensive review was conducted on databases such as Medline, Ovid and Science Direct with the following keywords: Nursing care and oncologic emergencies. Finally, 14 English written articles published during the last 10 years were selected.

Results and Discussion: In this article we discussed 5 of the most common oncological emergencies including disseminated intravascular coagulopathy (DIC), tumor lysis syndrome, septic shock, spinal cord compression, syndrome of inappropriate antidiuretic hormone (SIADH) by focusing on nursing management.

As the nurses have an important role in timely and appropriate intervention in oncologic emergencies; it is crucial to improve nurses' knowledge to reach more positive outcomes and reduce the morbidity and mortality rate.

Communication skills of nurses during interactions with BMT patients

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Background:

Communication and interpersonal relationship with patients is the major component of nursing care. Although other factors such organizational culture and policies those can effect on quality of communication, but health care competence on that it would help to build a positive relationship between nurse and patient. The effective communication can help to provide quality nursing care, patient's satisfaction and their family members. Particularly effective communication skills for nurses or other health professional can help a lot in case of high risk and stressful situations (such as oncology wards and breaking the bad news to the patients and their families, caring of the patient with the end up stage of cancer disease, etc). Often researches on nursing care complain about poor relationship in the health care setting between patient and caregivers such nurses. Some studies indicated that patients feel health care personnel do not meet all their communicative needs. The results of studies indicated that a group of patients believe that nurses sometimes did not listen to them carefully, did not explain things clearly. They do not pay attention to what patients say, and do not spend enough time with them. Gaps in communication between nurses (caregivers) and patients result in decreased quality of care, poor outcomes, and dissatisfaction with health care system. So any study or intervention in this field could be helpful for understanding some factors which could influence on nurse-patient communication in regarding to improving patients' outcomes in cancer care. The aim of this article was to determine the answer through the literature review to these questions 'what are the effective communicative skills (behaviors) in cancer care and what factors affecting the communication between patients with cancer and nurses".

Materials and Methods:

The method of the present article was literature searching with key words such as: effective communication, barriers of effective communication, Nurse- patient with cancer care, patient center communication in oncology nursing, caregiver and patient relationship, factors effecting on patients outcomes and satisfaction with focused on the health care settings concerns from different electronic data banks such as: Scholar Google, PupMed**, MEDLINE**, Palliative Medicine, Med scope and etc. In regarding to answer the study questions (what are the effective communication skills for patients with cancer diseases, what are the factors that could be effect on the nurse - patient communication skills in cancer health care settings concerns). This literature review was undertaken to draw a picture of the effective communication between nurses – patients with cancer diseases in the world.

Results:

The importance of effective communication skills within cancer care is well-documented in the most relevant articles. It was mentioned that communication within oncology is a core clinical skill for all cancer nurses whom is working in oncology wards. Those who working in this setting such as oncology nurse should be well trained in effective communication skills, but one in which few specialist cancer nurses have received much formal training on that. So nurses need to be trained well in effective communication skills. It has been demonstrated that effective communication can reduce stress, feelings of anxiety and uncertainty in patients. In addition, the majority of study results showed that nurses who have communication

skills and knowledge gain the trust of patients in communication process. Current practice emphasizes quality nursing care, which requires nurses to assess the needs and preferences of the patient through effective communication and provide corresponding care to meet these needs. Effective communication encourages patients to express their anxieties and in return, patients gain emotional relief. Supportive communication enhances patients' psychological adjustment and thus improves patient outcomes. Inadequate communication may cause much distress for patients and their families, who often want considerably more information than is usually provided. The evidence suggests that good communication promoted disclosure. Patients wanted honest and accurate information which needed to be provided by nurses in a sensitive manner. Every individual is unique, so each patient may respond differently to the information delivered. Nurses who were mindful, empathetic and flexible in their approach were better at facilitating patient disclosure. Communication was also enhanced when nurses showed genuine care and concern for patients. This included good eye contact, empathy, active listening to the patients and family members, engaged dialogue, appropriate tone of voice and touch. In addition, nurses who were knowledgeable and competent in effective communication increased patients' confidence and trust in them. Understanding the factors influencing the communication could be the first step to solve communication problems. In fact, it can be said that a satisfactory communication is impossible without sufficient and comprehensive understanding of the views of nurses and patients. The result of qualitative study result showed that three important factors on interpersonal relationship in the cancer nursing care. Patient as the center of communication, nurse as a human factor, and organizational structures were considered. These categories explain the underlying psychosocial and cultural factors influencing nurse – patient communication in oncology care environment. Understanding the factors influencing the communication could be the first step to solve communication problems. In fact, it can be said that a satisfactory communication is impossible without sufficient and comprehensive understanding of the views of nurses and patients. The factors affecting the communication between patients with cancer and nurses. This study indicates that the triangle of patient, nurse, and organization can play a decisive role in the effectiveness of this communication. Professional and psychological characteristics of the nurses were other influential factors on the nurse-patient communication.The effective communication skills trainings should promote nurses' perception of their various roles for providing support to the patients with cancer. Managers must support nurses emotionally considering nurses' personal and professional problems and ongoing under job trainings in effective communication skills and competency for cancer nursing in hospital setting.

What is palliative care?

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Palliative care is a multidisciplinary approach to specialised medical care for people with serious and chronic illnesses such as cancer, cardiac disease such as congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), kidney failure, Alzheimer's, Parkinson's, Amyotrophic Lateral Sclerosis (ALS) and many more.

. It focuses on providing patients with relief from the symptoms, pain, physical stress, and mental stress of a serious illness—whatever the diagnosis. The goal of such therapy is to improve quality of life for both the patient and the family. Palliative care is provided by a team of physicians, nurses, and other health professionals who work together with the primary care physician and referred specialists (or, for patients who don't have those, hospital or hospice staff) to provide an extra layer of support. It is appropriate at any age and at any stage in a serious illness and can be provided along with curative treatment.

It also helps you gain the strength to carry on with daily life. It improves your ability to tolerate medical treatments. And it helps you have more control over your care by improving your understanding of your choices for treatment. Palliative care is a team approach to care. The core team includes doctor, nurse and social work palliative care specialists. Massage therapists, pharmacists, nutritionists, chaplains and others may also be part of the team.

The team spends as much time as necessary with you and your family. They become a partner with you, your family and your other doctors. They support you and your family every step of the way, not only by controlling your symptoms, but also by helping you to understand your treatment options and goals.

New Findings in Traditional Iranian Medicine(T.I.M) about the prevention and treatment of cancer.

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Abstract

After cardiovascular diseases, cancer is the second leading cause of death in the world. After cardiovascular diseases and traffic accidents, Cancer is the third cause of death in Iran. As cancer is a common disease worldwide, could be targeted at all age groups in society. The treatment of Cancer is very complex and the discovery of new anticancer drugs with high efficacy, low cost and low toxicity with selectively affect on the infected cells, including the concerns of the health system. Although billions of dollars spent annually in the world to treat cancer, but still effective methods of prevention and the cure for this disease does not exist.

In Traditional Iranian Medicine(T.I.M), so as a medical school and the old index, has been paid to this disease. The term cancer (cancer means crab) was used in Traditional Iranian Medicine under the name saratan and its means is cell mass that because of encroaching on the adjacent tissues, like those crab legs are created. Cancer based on the Avicennas point of view(as the most famous physician in this school), is a cold swelling caused by abnormal Article Souda that in the early stages of the disease can be controlled and it can be removed from the aggressive mode.

Life style Modification is the first and most important factor to protecting and promoting the health in T.I.M and therefore is very effective in prevention, well as reduce and controlling of cancer symptoms specially in the early stages. Many factors in this medical school to improve life style, have in common with views of conventional medical scientists in this field. Weather modified and avoid from micro-pollutants and cigarette, using fresh and healthy, natural and Non synthetic food and beverages, regular and adequate physical activity and sleep, avoiding from enviromental stresses and good mental condition, Clearing the body of waste and harmful factors, is considered to prevention and control and reduce symptoms of cancer in T.I.M. Drug treatment is also one of the key tenets of Traditional Iranian Medicine. Drugs origin used in T.I.M, is divided in the three categories of plant, animal and mineral. In previously studies, 48 herbal medicine is detected to control this disease in the main sources of T.I.M. Many of these plants have antioxidant properties or has anti-cancer effects on cell lines in the laboratory and animal studies.

Due to predict the impact of lifestyle modification and medications referred to T.I.M, in prevention and control of symptoms in cancer patients, Seems to be more experimental and clinical research to prove conclusively is required.

Keywords: Traditional Iranian Medicine(T.I.M), cancer, life style modification

Personnel Safety in Chemotherapy

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Introduction: Cancer chemotherapy drugs and administration of antineoplastic drugs is a process which leads to harm to the patients. When the safety standard is not considered and expansion of chemotherapy will occurred, cause to health problems and adverse health effects for the health care workers (HCWs) such as respiratory, reproductive and other. Due to drug toxicity working with antineoplastic drugs need to consider the precautions in terms of transport, preparation, administration and waste of them.

Materials and methods: The evidence about safe chemotherapy, precautions and health problems in HCWs related to chemotherapy drugs were reviewed. The ten studies selected from searched studies and were reviewed.

Results: There are many instructions for personnel safety, which should be considered in order to reduce the harmful effects.

Discussion: Safety and personnel protection is one of the main and important cases which should be considered in order to reduce the risk of exposure. Personnel especially pharmacists and nurses as two occupational groups have the highest potential of exposure. So they should use personal protective equipment (PPE) such as gloves, gowns, masks, eye/face protection (safety goggle or face shield) in contact with these drugs. When PPE contaminates with drugs should be removed in case of the equipment contaminated and must be placed in a plastic bag and put into the chemotherapy waste container. Washing of the location should be done. Also personnel must avoiding eating, drinking in area where drugs are prepared.

Preparing chemotherapy drugs should be done regarding to safety cabinets and closed system devices. Hoods need to engineering control and monitor regarding to proper functioning. Upon completion administering chemotherapy and in order to environmental protection should all waste material excreted in the right way and into the chemo waste bag. Cytotoxic or chemotherapy drugs label should be attached to the remaining material used, excess chemotherapy agents and empty vials and then thrown away. After the administration because patient's body fluids include of cytotoxic metabolite the PPE should be worn, if contamination is probable. Paying attention to these cases, then reduce the risk of exposure to other staff such as environmental services workers and shipping and receiving personnel.

Fatigue and ways of coping with it in cancer patients

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Introduction: Fatigue means tiredness and lack of energy. Fatigue for people with cancer can be very different. The cancer or its treatment may make you feel very tired. The tiredness may not go away even when you rest.

Materials (or patients) and methods : The present review of the literature aimed to investigate the concept Fatigue and ways of coping with it, in view of cancer patients.In the present study, the following websites were used: SID, Prequest, Cochran, Elsevier, Web of Science, PubMed, Magiran, Google scholar, and Iran medex. Initially, subject search, MESH, and keywords from 2005 to 2015 were used. Eventually, 20 articles remained and were studied.Researcher used terms including 'fatigue', 'coping', 'Compatibility' , 'Adaptability'.

Results: symptoms are very general and other things can cause them. For example Lack of energy, Feeling you just cannot be bothered to do much, Problems sleeping, Finding it hard to get up in the morning, Feeling anxious or depressed, Pain in your muscles, Being breathless after doing small tasks, like having a shower or making your bed, Finding it hard to concentrate, Finding it hard to think clearly or make decisions easily, Loss of interest in doing things you usually enjoy Negative feelings about yourself and others.

Fatigue is often worse in people who,are having a combination of treatments and Have an advanced cancer and Are elderly. A cancer that affects your hormone levels could cause fatigue. People with advanced cancers seem more likely to have fatigue than people in the earlier stages. This could be because there are more cancer cells in the body.

Treating and Coping by relieving related conditions such as anemia and depression. Treatment of pain.Treatment of depression .Certain drugs are being studied for fatigue related to cancer.Certain dietary supplements are being studied for fatigue related to cancer.Treatment of fatigue may include teaching the patient ways to increase energy and cope with fatigue in daily life. A schedule of activity and rest and Talk therapy and Self-care for fatigue is needed.

Discussion: Fatigue is often caused by more than one problem. Treating a certain problem, like anemia, might make you feel better, but other things may need to be done, too. Since fatigue may greatly affect the quality of life for cancer survivors, Treating and Coping and long-term follow-up care is important.

life expectancy (LE) in Elderly undergoing chemotherapy

Ghanbari moghaddam Akram,Mohammadi Mojtaba

Abstract:

Background and Object: Recent studies show's that over %77 of all cancers take place after 55 years old. Illnesses like this as well as physical, compromising psjchological conditions of them. So could be tell that, in this period, aged people in addition to medical swpport will need attentions like social support and life expectancy (LE).

Materials and Methods: our target population in this cross-sectional study was Elderly undergoing chemotherapy Cancer Institute of Tehran. Samples were 100 people above 60 years old that enrolled with random selection from hospital (Emam-Khomeini) . Data collection tools was an questionnaire consists of two parts: demographic and Senior's Life expectancy 12-item questionnaire Schneider that were completed through interviews.

Results: Findings suggest that Life expectancy was significantly lower in the samples(p=0/001). More elderly was also social isolation and A sense of disappointment after cancer has increased.

Conclusion: . If nurses recognize the needs of pts. With difficult diseases like cancer would have a significant role in the care and recovery of them. Because of the most efficient nursing inter venation is morale boosting in cancerous pts. Particularly in seniors.

Vaccination of Hematopoietic Stem Cell Transplant (HSCT) Recipients

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- **Introduction**

Hematopoietic stem cell Transplant (HSCT) is a procedure to replace damaged or destroyed bone marrow with hematopoietic stem cells. This procedure is mainly used to treat certain cancers and blood disorders. One of the most important obstacles for successful transplantation is infection. Therefore, prevention of infections, by revaccination, is very important in transplant recipients. Various recommended vaccination guidelines and schedules for HSCT are published by different professional organizations and centers. The general goal of these guidelines is to reduce and control the vaccine preventable infections and diseases in these patients. The aim of this study is to describe and update current vaccination schedules for these recipients.

- **Methods**

In this study we reviewed literature and guidelines updated and published by centers for disease and control prevention. Computerized English-language literature searches of the National Library of Medicine PubMed database were performed using the terms "vaccination," "vaccine," "Hematopoietic stem cell Transplant" and names of specific vaccines for these patients. Selected references in selected publications were also studied.

- **Results**

The results are organized into different sections such as timing of vaccination, safety of vaccination, and vaccines used for these patients. Also, recommendations for vaccination of the patients before and after transplantation are provided.

- **Conclusion**

In this study the current evidence on the use of vaccines in Hematopoietic stem cell Transplant was reviewed and updated. Revaccination of hematopoietic transplant patients is recommended by the most guidelines and literatures. Vaccination can protect these patients from vaccine-preventable diseases. However, some general conditions should be taken into account, before starting vaccination. Vaccination of family members, close contact and health care workers is recommended to reduce the risk of transmission of infections to the HSCT recipients.

Key words: Vaccination, HSCT recipients, Specific vaccines, Infection.

Nursing care of patients on Hematopoietic Stem Cell Transplantation (HSCT) after discharge

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Introduction: Organ transplantation is a treatment option for patients with end stage organ disease that organ transplants cause Prolong survival and improved quality of life. But on the other hand is associated with significant mortality and morbidity. That's why organ transplants must be performed when there are no other effective treatment options and prongs are used by this action is better than other treatment. Patients who have been treated with a Hematopoietic Stem Cell transplantation after a period of 3-12 months, according to the doctor's clearance to be put under examination and outcome of patient complications will dealt and this time, patients are often treated with certain oral medications.

Content: first bill for organ transplants were rejected in parliament of Iran in 1374, but finally in 1379 the organ of the transplant patients or patients who died of brain death is certain they were approved by Parliament. Islamic jurists belie persons of alive can give their organs that want to donor to a person or a donation center; provided that: The loss of an organ does not lead his own death or humiliation and goal is to be rational.

Nursing care of patients on Hematopoietic Stem Cell Transplantation (HSCT) after discharge including of: Prepared home environment for transplant patients before transferring the patient to home. Make a good diet; the establishment of an optimal diet in patients is often difficult, because of change in taste, tenderness of the mouth and ulcers cause such difficulty. Focus on oral health; Avoid from contact with domestic animals, plants and swimming is necessary. Prevent of bleeding, infection and follow up is very important

Conclusion: The patient may be discharged before complete resolution of safety and is used of isolation at home. Family and patient should be supported mentally, because the patient may not be better than before the transplant. The patient initially once a week and then monthly, in first year for follow-up examinations and necessary tests must refer.

Keyword: Nursing care, HSCT discharge,

Portcath

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A port consists of a reservoir compartment (the portal) that has a silicone bubble for needle insertion (the septum), with an attached plastic tube (the catheter). The device is surgically inserted under the skin in the upper chest or in the arm and appears as a bump under the skin. It requires no special maintenance and is completely internal so swimming and bathing are not a problem. The catheter runs from the portal and is surgically inserted into a vein (usually the jugular vein, subclavian vein, or superior vena cava). Ideally, the catheter terminates in the superior vena cava, just upstream of the right atrium. This position allows infused agents to be spread throughout the body quickly and efficiently.

The septum is made of a special self-sealing silicone rubber; it can be punctured hundreds of times before it weakens significantly. To administer treatment or to withdraw blood, a health professional will first locate the port and disinfect the area, then access the port by puncturing the overlying skin with a 90° Huber point needle, although a winged needle may also be used. Due to its design, there is a very low infection risk, as the breach of skin integrity is never larger than the caliber of the needle. This gives it an advantage over indwelling lines such as the Hickman line. Negative pressure is created to withdraw blood into the vacuumized needle, to check for blood return and see if the port is functioning normally. Next, the port will be flushed with a saline solution. Then, treatment will begin.

Collection of hematopoietic progenitor cells from healthy donors

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Inrtoduction:

Allogeneic hematopoietic progenitor cell (HPC) transplantation is an established therapy for many hematologic disorders. HPCs may be collected from bone marrow, peripheral blood, or umbilical cord blood. In order to minimize the risk for healthy HPC donors, thorough investigation is required before donation. The donor work-up should include medical history, physical examination, ECG, chest x-ray, blood count, coagulation screening, and testing for infectious disease markers. Donors should be fully informed on the donation procedure and sign an informed consent for donation. HPCs are traditionally collected from bone marrow with the donor in general anesthesia. The procedure includes multiple bone marrow aspirates from pelvic bones and at least overnight hospital stay. Although marrow donation is generally safe and well tolerated, minor complications like pain at the collection site, fatigue and pain on walking or sitting may occur in a relatively small proportion of donors (6%-20%). Major and life-threatening complications such as anesthesia-related events, mechanical injury to the bone, sacroiliac joint and sciatic nerve following marrow donation are relatively rare, being estimated to 0.1%-0.3% of cases. In the last decade, peripheral blood progenitor cells (PBPC) have become an increasingly used altemative to bone marrow. PBPC transplantation offers faster hematopoietic recovery and lower early transplant-related morbidity and mortality. The incidence of acute graft vs. host disease (GvHD) is no greater than in bone marrow transplants. However, there is evidence for increased chronic GvHD, which is in part related to the higher number of T and NK cells that are collected with PBPC and re-infused to the patient.

Material &Method

Recombinant human granulocyte colony-stimulating factor (G-CSF) is used to mobilize PBPCs for collection by leukapheresis. Leukapheresis is usually perfomed after 4 to 5 days of G-CSF subcutaneous administration at a dose of 10 mg/kg b.w. Vascular access for apheresis may be accomplished by use of apheresis needle in antecubital vein. Placement of a double-lumen central apheresis catheter is rarely required in healthy donors. Citrate is the most commonly used anticoagulant for apheresis. One to three leukapheresis procedures are required to collect adequate graft.

Result

There is an interindividual variation in progenitor cell mobilization among healthy donors, with a subset of donors that do not exhibit effective CD34+ cell mobilization. Donor age and G-CSF schedule are the factors that significantly affect PBPC mobilization and collection in healthy donors. Procedures for mobilization and collection of PBPC from healthy donors are generally well tolerated. Common adverse reactions of G-CSF application include bone pain, myalgia, headache and fatigue. Beside these mild side effects, moderate to life-threatening complications are sporadically observed. Spontaneous splenic rupture, acute lung injury, acute iritis, severe pyogenic infections, and anaphylactoid reactions were reported in healthy donors after G-CSF administration. Adverse effects of apheresis for PBPC collection are the same as for other apheresis procedure and include complications related to venous access and citrate toxicity. Leukapheresis typically results in a lower platelet count, an effect that is exacerbated by the use of G-CSF, which has been documented to cause

mild, reversible thrombocytopenia. Fewer side effects were noted in pediatric donors compared to adult donors. PBPC collection in pediatric donors is safe and desired PBPC yields are easily achieved. Theoretical concerns exist about the potentially increasing long-term risk of leukemia after G-CSF administration in healthy donors. Recently, a report of AML developing in a 62-year-old female donor 14 months after G-CSF-primed PBPC donation has been published.

Conclusion

Whether G-CSF therapy contributed to the development of this cancer is unknown, but future studies should carefully follow the donors and report any similar event. According to currently available evidence, the risk of major late toxicities secondary to administration of G-CSF is minimal.

Application of stem cells in regenerative medicine

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Regenerative Medicine is a branch of research in tissue engineering and molecular biology which aims at helping the body to form new functional tissue to replace lost or defective ones. In regenerative medicine, stem cells play a central role and can use to repair, regenerate or replace diseased cells, tissues and organs. Stem cells have self-renewal capacity and can differentiate into multiple cell lineages. Thus, they represent an important building block for regenerative medicine.

Stem cells have special properties which make them powerful candidates for clinical application. They can home to sites of inflammation following tissue injury; differentiate into various cell types; secrete multiple bioactive molecules capable of stimulating recovery of injured cells. Moreover, a number of anticancer genes have been successfully engineered into stem cells, which then demonstrate anticancer effects in various carcinoma models.

This study primarily focuses on the recent developments in the use of the stem cells in the regenerative medicine. Moreover, a brief outlook on the past, present and the future of stem cell-based therapies in clinical practice will be presented.

Breast cancer and kidney transplant recipients

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Introduction: Advances in the development of immunosuppressive agents have significantly reduced the acute rejection rate and markedly improved graft survival in kidney trans- plantation. Despite these encouraging trends, the long-term patient survival rate after kidney transplantation has remained unchanged. The incidence of malignancies in kidney transplant recipients is increasing.

Methods: We searched the Cochrane Stroke Group Trials Register, the Cochrane Central Register of Controlled Trials, MEDLINE , EMBASE , Science Citation Index . We hand searched potentially relevant conference proceedings, screened reference lists, and searched ongoing trials and research registers.

Results: Results showed that breast cancer (BC) is a common malignancy after kidney transplantation and can be more aggressive in kidney transplant recipients than in the general population. KTRs that develop breast cancer are often younger at diagnosis and have poorer outcomes than the general population. BC is the most common cancer and the leading cause of cancer-related death worldwide. Major risk factors include age, family history, and long-term hormonal replacement therapy, which have been strongly linked to cancer stage at diagnosis.

Conclusion: Studies recommend that patients aged between 40 and 50 years should also undergo the screening test as general population Management of patients by using immunosuppressant drugs after BC diagnosis is a matter of concern. Annual screening tests are crucial in the early diagnosis of breast cancer. Early treatment of breast cancer can result in an excellent prognosis in kidney transplant recipients.

Nurse telephon follow up in survivors of hematopoietic stem cell transplantation

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Introduction: Recent advances in hematopoietic stem cell transplantation techniques and supportive care strategies have resulted in a significant improvement in survival .Despite this advances, the survivors of hematopoietic stem cell transplantation are at risk of developing long-term complications.So Long term follow up of patients transplanted is a key ingredient in improving quality of life and overall survival. Follow-up survivors can be ensured by regular telephone consultations by experienced and specialized nurses.Tele nursing is considered a low cost and easily intervention to increase their efficiency in meeting patients' needs. current study with the aim of nurse telephone follow up survey was conducted with survivors of hematopoietic stem cell transplantation.

Materials and methods: This study is a review of nurse telephone follow up in survivors of hematopoietic stem cell transplantation. Data extracted with search keywords;tele nursing, follow up, hematopoietic stem cell transplantation in the database SID, Magiran, Irandoc, Medlib, Google scholar, Pubmed and the results were mixed.

Results: Articles assessment showed that a study with this keywords has been done on this specific population in Iran. But few studies have been conducted on transplant survivors in other countries.According to these studies, nurse telephon follow up is as a safe intervention in the evaluation of survivors with complex and unique needs after transplant. In telephon follow up, nurses respond to questions related to the transplant of survivors and their care providers after discharge from the transplant centers.In fact nurse telephon follow up is a reliable method to assess the needs of patients, early recognition of symptoms and complications, continuity of care, exchange information, health education and referring patients to appropriate centers to solve problems. Eventually this telephon follow up Causing to increase the satisfaction of the survivors and their caregivers and reduce the complexity of patients' conditions.

Discussion: Due to limitations transplant survivors in permanent access to attending physicians to long term follow up, launch services of telephone follow-up specialist nurses to improve the quality of life for survivors after transplantation offered. Also, with regard to the lack of studies in this area, it is recommended that more research done on the telephone follow-up clinical specialist nurse in this specific population.

Uncertainty and hope : Experiences of patients Cancer

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Abstract

Introduction: The treatment quality of diseases can affect the patient's experience. Due to its different complications among cancer patients, the experience of chemotherapy is unique. The present study was conducted to explore the lived experience among cancer patients who had received chemotherapy.

Methods: The study was conducted by a qualitative approach and a phenomenological method. In so doing, 12 cancer patients who had received chemotherapy were purposefully selected were interviewed using an in-depth method. After the required data were collected, they were analyzed by Tanner, Allen, Diekelmann method.

Results: Analysis of the collected data indicated that the experience of chemotherapy appeared as "Uncertainty and hope " for the patients. Secondary themes of the Uncertainty and hope included Ambiguity and concern and Hopefulness

Conclusion: According to the results of the study, it was concluded that in addition to taking into providing mental-spiritual support and reducing the complications of the treatment, nurses in chemotherapy wards should pay attention to the experiences of the patients receiving chemotherapy and enhance hope and positive attitude among them.

Nursing Posters

Effect of patient_ care giver education on cancer related self efficacy

Running title: enhancing cancer related self-efficacy

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Abstract

Background and objective:

Breast cancer is the most common cancers among women population and adaptive strategies play an important role regarding adjustment to disease and treatment. One of the most important needs of breast cancer patients regarding adjustment is information. The aim of this study is to investigate the effect of patient_ care giver education on cancer related self efficacy of breast cancer patients undergoing chemotherapy.

Material and Method:

This is a controlled randomized clinical trial. 30 patient care giver pair allocated randomly to intervention or control group. Intervention group received 2 verbal education sessions along with 4 telephones follow up and a written booklet. Education was given to patient and her care giver simultaneously. Control group received routine care only. Post test was taken 6 weeks after the pre test in both groups using Cancer related self efficacy scale. Data was analyzed using SPSS software version 13.

Results:

Finding showed that patient_ care giver education can improve cancer related self efficacy of patients in intervention group rather than control group ($p<0.05$).

Conclusion:

Results of this study confirm our hypothesis that patient_ care giver education can increase cancer related self efficacy of patients undergoing chemo therapy.

The effect of education on self-care behavior in patients with cancer

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Introduction: The diagnosis of cancer is unfavorable event for patients and their families, therefore, patients need to manage their disease, to have very strong supportive care and high knowledge of their disease. So, nurses play a significant role in the care and education of patients.

Methods: The study included 110 patients hospitalized in BMT wards from July 2012 to July 2014. The patients were diagnosed with AML, ALL and AA. The patients were between 17and 60 years of age. All patients received allogeneic peripheral blood stem cell transplantation. The patients were educated in 3 steps: before entering the ward, during hospitalization and after discharge. Patients filled out General Health Questionnaire (GHQ) in two steps, first time before entering the ward and next time on the day of discharge.

Results: All patients and their families cooperated with nurses and accepted their therapeutic plans. The anxiety and stress of patients were reduced and their families felt comfortable.

Conclusion: The results of the study revealed that education can help the patients and their family members understand the disease, overcome psychological problems such as stress and anxiety, reduce treatment side effects and improve outcomes.