and prednisolone starting at day +7 with 0,5 mg/kg, increased to 1 mg/kg on day +14.

Results: Seven patients (3 BMT from a matched related donor (MRD), 1 PBSCT from MRD, 3 BMT from a matched unrelated donor (MUD)) demonstrated a sustained engraftment, chimerism analysis revealed 89% to 100% donor cell origin in peripheral blood samples.

Two patients (PBSCT from MUD) suffered from graft failure after initial engraftment: one patient had full thalassemia recurrence with 0% donor cells, the other patient lost the graft with autologous recovery (early mixed chimerism) followed by re-occurrence of aplastic marrow.

Organ toxicity: most patients demonstrated mucositis grade I-III of the oral cavity and the intestinal tract, reversible elevation of liver enzymes and kidney function tests; CSA associated complications such as seizures, hypertensive crisis and visual hallucinations occurred in two patients.

Graft versus host disease (GvHD): no severe acute GvHD occurred, two patients developed chronic limited GvHD of the skin and liver.

Survival: Seven out of nine patients are well and alive (days +1400 to +60). One patient died due to graft failure, the second patient died two years post-transplant due to intestinal bleeding.

Conclusion: HSCT from MRD and MUD is a well-established treatment in patients with beta-thalassemia. The clinical course and outcome of MRD-BMT seems considerably better than that of MUD-PBSCT. Our results suggest that allogeneic HSCT can even be performed in adult thalassemics without increase in toxicity and infectious complications.

357 POSTER

Idarubicin containing regimen in mm: preliminary results of pilot study of a modified "tandem" transplant program

. *G. Martinelli[1], A. Agazzi[1], P. Greco[2], K. De Luzio[1], R. Pastano[1], A. Alietti[1], P. Mancuso[1], A. Vanazzi[1]*

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Background: The definitive role of double HDCT with APBSC has been recently established. However, the optimal myeloablative regimen to be used before HSC transplantation in MM remains questionable. Preliminary results arising from EBMT registry suggest a possible benefit in terms of EFS for those patients who received combination CT as a part of tandem transplant. Idarubicin, antracycline analogue, has demonstrated its activity in some hematologic malignancies. However few data are up to now available on its use in high CT setting.

Materials and methods: From January 1997 to April 2001 we treated in our Institution 15 MM consecutive pts (median age 62 years, range 48-69, ratio male/female 3:1, 10 IgG, 5 IgA, 2 stage II, 11 stage III Durie-Salmon at diagnosis) after previous VAD regimen (median 3 cycles, range 2-6). MGUS preceded MM in 9 (60%) pts, elevated B2 microglobulin was present in 6/14 (42%) and high erytrocyte sedimentation value in 11/15 (73%). Skeletal lesions were demonstrated in 11 (73%): pamidronate was given to 6/15 (40%) and RT in 4/15 (26%) previous HDCT. Five pts received tandem traditional transplant with Melphalan alone and 10 pts, after one cycle of high dose Melphalan, an additional cycle with Melphalan and IDA combination (180 mg/sqm and 45 mg/sqm c.i. respectively) according to PS and age. Each cycle was supported by APBSC reinfusion (at least 2.0 x 10 6 CD34+/kg).

Results: After the VAD chemotherapy, 2 CR (13%), 12 PR (80%) and 1 SD (7%) were observed. After HDCT (12 pts evaluated), the ORR reached to 6 CR (50%) and 6 PR (50%). 4/6 CRs were observed in pts receiving HD IDA containing regimen. With a median follow-up of 22.3 months (range 8-80), 3 pts are still in CR after 27, 3 and 2 months respectively; two of these pts received IDA containing regimen transplant. One pt died of disease. Hematological toxicity observed was more severe for pts receiving antracycline containing regimen; time to WBC recovery was 12 days vs 6 days for the double Alkeran schedule. 57% of pts receiving IDA experienced G3 mucositis and febrile neutropenia. No toxic death was recorded.

Conclusions: Our preliminary results seem to confirm that double HDCT is feasible also in older MM pts. The high rate of CR observed after HDCT confirm a dose-response relationship. The addition of HD IDA in c.i. at least in the second HDCT procedure seems to increase the complete remission rate despite higher hematological and non-hematological toxicity.

358 POSTER

Tbi using compensators: 16 years of experience in patients with b cell malignancies

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Purpose: Total body irradiation (TBI) in preparation for BMT and ABSCT is a routine treatment of B Cell Lymphoproliferative Disorders. The aim of this study is to report 16 years of experience with special focus on side effects.

Project: Since 1984 TBI prior to BMT or ABSCT is performed as a preconditioning regimen in B Cell Lymphoproliferative Disorders. The total dose of 12 Gy and a reduced lung dose of 11 Gy is delivered within 6 fractions on 3 subsequent days using a bilateral compensator technique. For calculation of the individual compensators, one for each hemibody, a series of up to 80 CT-scans of the entire body is used to take into account the patient's contour and density distribution of tissue. This controlled optimized dose distribution should minimize the side effects in general. Up to now we treated a total of 218 patients with B Cell malignancies. We treated 33 patients with ALL, 35 with Follicular Lymphomas grade I,II, one pat. with grade III, 14 with Mantle Cell Lymphomas 12 with Lymphoplasmocytic Lymphomas, 9 with Plasmacytoma and 14 with B-CLL. For determination of 3-year-survival-data and incidence of effects associated with TBI we evaluated data of all those 118 pat., treated during the time intervall 12/84 to 12/97. 75 pat. underwent an ABSCT and 43 an Allogenic Stem Cell Transpl. or BMT.

Results and conclusions: Without discrimination of age, sex, disease, chemotherapy etc. we found an overall 3-year-survival-rate of 65%. The overall survival rate up to now is 59%. The follow up time of the survived pat. is 56 months (12 to 17months).Interstial pneumonitis occurred in 7 of 118 pat., 5 of them died. 12 pat. developed other pulmonary complications, 4 of them died. Nausea and vomiting occurred 57% and 32% during the acute phase with radiation, chemotherapy and tranplantation. 22 pat. developed an acute GvHD, 4 of them died.

Long term side effects were seen in 5 cases of cataract complications, in 6 cases of reduced pulmonary function and in 5 cases of reduced kidney and liver function. 13 pat. developed a cGVHD grade I-II. 10 pat. complained a lower capacity or a fatigue. Other complications were observed only in individual cases. 40 pat. had a relapse. Up to now 32 of those died. 60% of the survived pat. did not get any long term side effects.

The TBI using compensators seems to be as effective as other regimen. The rate of acute and long term side effects is obviously lower than using conventional treatment schemes.

359 POSTER

Apoptosis detection on CD34+ cells by flow cytometry on fresh and cryopreserved/thawed leucapheresis products

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The apoptotic program is characterised by certain morphological features, including loss of plasma membrane asymmetry. In apoptotic cells, the membrane phospholipid phosphatidylserine (PS) is translocated from the inner to the outer leaflet of the plasma membrane, exposing PS to the external cellular environment. Annexin V is a phospholipid-binding protein with a high affinity for PS and binds to the cells that exposed it. After the loss of membrane integrity, DNA fragmentation occurs. So, using Annexin V conjugated with phycoeritrin (PE) and use a vital dye like 7-amino-actinomycin D (7-AAD), we can identify the different stages of apoptosis and dead cells. The aim of our work is to look at the effect of cryopreservation on the apoptosis of the CD34+ cells, in G-CSF mobilised PBPC collections, obtained by apheresis. Leucapheresis products (LP) were frozen on a Planner, cryopreserved at -190°C in liquid nitrogen and thawed at +37°C, in a water bath. B So far, we have analysed 7 LP from 4 patients on fresh and thawed samples using the Annexin V-PE Apoptosis Kit I (PharMingen - ENZIfarma, Portugal), CD34 FITC and CD45 APC MoAb (BD - ENZIfarma, Portugal). Cells were labelled according to the manufacturer instructions and analysed by flow cytometry in a FACSCalibur (BD - ENZIfarma, Portugal). After gating on CD34+ cells (based on CD34+ FITC/SSC), the different apoptotic subpopulations were defined by Annexin V and 7-AAD according to the following criteria: Annexin V-/7-AAD- (live cells), Annexin V+/7-AAD- (early apoptotic cells) and Annexin V+/7-AAD+ (late apoptotic or dead cells). In the majority of fresh and thawed samples > 80% CD34+ cells are viable; only in one case, due to freezing problems, all thawed cells were dead. Our

preliminary results do not show an increase in the early or late apoptosis of CD34+ cells, following cryopreservation. We hope to standardise this method for routine evaluation of CD34 + cell viability of the grafts to be used in haematopoietic transplantation. This work was supported by a grant from CFICS n°266/99 - Ministério da Saúde

360 POSTER

Relationship between immune abnormalities post-high dose chemotherapy with stem cell support in patients with solid tumors and tumor type and stage

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Background: High-dose chemotherapy (HDC) with stem cell rescue induces profound immunosupression. Recovery of cell-mediated and antibody-mediated immunity takes 1-2 years and inversion of CD4/CD8 ratio persists for at least 1 year. Infusion of peripheral blood derived hematopoietic stem cells(PBSC) results in faster recovery of blood counts than bone marrow infusion. Is immunological recovery also faster?

Aims: We have evaluated immunological recovery after HDC+ PBSC and factors influencing immune recovery.

Patients and methods: Lymphoid subpopulations in peripheral blood were quantified by flow-citometry using surface markers CD3, CD4, CD8, CD19 and CD56. IgG, IgA, IgM and IgE concentrations were also measured. These parameters were measured 1, 2, 3, 6, 9, 12, 145, 18, 21 and 24 months (mo) after PBSC infusion in 41 consecutive patients (p) (9 males ans 32 females) treated with HDC+PBSC at our institution for metastatic breast cancer (20 pts), non-metastatic high-risk breast cancer (>10 axillary nodes or stage III) (10 pts), non-Hodgkin's lymphoma (7 pts) or other solid tumors (4 pts).

Results: The duration of cellular and humoral immune recovery was markedly different according to tumor type and stage but not to the number of CD34+ cells infused. As for cell-mediated immunity, median time to CD4/CD8 >0.8 was 3 mo (range 2-6) for pts with non-metastatic breast cancer versus 9 mo (2-24+) for metastatic breast cancer ($p<.05$), 6 mo (1-9+) for non-Hodgkin's lymphoma and 6 mo (1-8+) for other tumors.

Conclusions: Cell-mediated immune recovery after HDC+PBSC is faster than that reported for bone marrow infusion and differs according to tumor type and stage.

Growth factors/cytokines

361 POSTER

High incidence of thrombosis using G-CSF in the treatment of chemotherapy-induced neutropenia

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Background: G-CSFs are widely used as potent myelopoietic stimulators. However, its activity is not restricted to the myelopoietic system and several observations suggest that G-CSF could interfere with the hemostatic balance. The prevalence of thrombosis in cancer patients has been estimated as up to 15%. In order to assess the interaction between G-CSF and hemostasis, a retrospective analysis, was performed on 409 patients, treated with G-CSF and chemotherapy from 1996 to 2000.

Patients and Methods: 287 were females and 122 were males, the mean age was 63,4 years, (range 43-76). No significant risk factors were detected; All pts had normal renal, hepatic and hematologic function and were divided in three groups according to the number of total treatments with subcutaneous G-CSF at the standard dosage of 5 mg/kg. In the first cohort (A) (n=188, 46%) pts were treated from 1 to 5 administrations of G-CSF, while the second (B) (n=135, 33%) and third cohorts (C) (n=86, 21%) respectively received from 6 to 10 and over 10 administrations. Thrombosis events occurred in 154 patients (37,65%) distributed as follows: Cohort (A): 18,18%, Cohort (B): 25,32%, Cohort (C): 54,49%.

Results: Thromboembolic complications of central venous catheter were observed in 57,8% of patients, while thrombosis of intra-arterial catheter and deep vein thrombosis were respectively 3,25% and 31,8% of cases. Seven patients (4,55%) developed subclavian vein thrombosis, pulmonary embolization in 1,95% of cases and in only one patient (0,65%) autopsy revealed acute multifocal cerebral venous thrombosis.

Conclusions: These observations indicate that G-CSF administration may induce a higher risk of thrombosis and a careful monitoring of the venous circolation should be done.

362 POSTER

IL-2 effect on NK cell phentoype of PBPC from healthy donors and patients

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Clinical studies have demonstrated that culturing PBPC in IL-2 enhances the generation of killer cells capable of lytic activity against malignant cells. The aim of this study was to evaluate the expression of NK associated markers, adhesion molecules and killer and activation-related receptors on CD56bright and CD56dim NK cells, before and after incubation of PBPC with IL2.

PBPC from 6 healthy donors (HD) and 4 patients were cultured with IL2 for 24h and studied by flow cytometry using 4-colour staining with anti-CD3 and anti-CD56, which allows the selection of NK cells defined as CD3- and CD56+, and two additional markers.

In HD, the majority of NK cells presented, before and after incubation, a CD56dim phenotype, whereas only 5% and 7%, respectively, was CD56bright. Although these two NK populations share several surface markers, statistically significant differences ($p<0,05$) were observed between them: pre-incubation -CD11c, CD16, CD57, CD94, CD158a, Granzyme B (GB) and HLA-DR; post- incubation - CD2, CD11c, CD16, CD57, CD94, CD158a, GB and HLA-DR. Following IL2 incubation there were differences within each CD56+ population: CD56brihgt cells showed an increased % of CD2+ and GB+ cells and a decreased % of CD161+ cells, whereas CD56dim cells demonstrated an increased % of CD69+ and NKb1+ cells and a decreased % of CD16+ cells.

Similar to HD cells, patient NK cells present a different phenotypic pattern for CD56bright and CD56dim cells. Comparing CD56+ populations of HD and patients we were able to detect various differences: pre-incubation - patient CD56dim cells demonstrated an increased % of CD16+ and CD94+ cells while CD56bright cells showed a decreased % of HLA-DR+ cells; post-incubation - whereas no discrepancies were encountered in CD56bright cells, the CD56dim population had an increased % of CD16+ and CD94+ cells and a decreased % of CD158a+ and GB+ cells. In what concerns pre-post incubation, a significant increase of CD69+ cells was observed in both CD56+ populations of patient NK cells.

Our preliminary results indicate that a 24 h incubation with IL-2 induces an increased % of CD69+ cells, not only in HD but also in patient NK cells. These results seem to agree with the function of CD69, one of the earliest activation markers acquired during NK cell activation. While comparing results of HD with those of patients, we were able to observe a differentiated pattern of some surface antigens specific for NK cells. Determining to what extent these cell surface receptors are functionally significant in NK cells will depend on further investigation, namely cytotoxic essays.

Head and neck cancer

363 POSTER

Limited dose external beam irradiation and interstitial iridium192 implant in definitive treatment of carcinoma of the oropharynx. Long term results

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Purpose: To evaluate long term treatment results of definitive radiation therapy in the treatment of carcinoma of the oropharynx.

Materials And Methods: 215 patients with biopsy-proven carcinoma of the oropharynx were treated during January, 1979 to October, 1995 at Long Beach Memorial Medical Center, California. There were 132 males and 80 female patients with median age of 60 (range 24 to 82 years). Forty-two patients had stage II disease and 173 patients had stage III/IV (AJCC) tumors. The external beam irradiation included the primary site as well as