the involved mucosal surface (small whitish polyps or whitish granules). A complete response was obtained in all patients that received R-CHOP, and no recurrence was seen.
Conclusions: Examination of the entire small bowel of PFLGI patients is necessary and DBE is useful for evaluation of patients with PFLGI. R-CHOP may produce a complete response, but it is necessary to monitor patients for as long as possible because of the risk of relapse.

6027 POSTER

Are there variations in the cause of deaths over different time periods in Hodgkin's disease?

B. Cantos[1], A. Hurtado[1], C. Maximiano[1], S. Mellor[2], A. Manquillo[2], P. Espinosa[1], M. Mendez[1], R. Cubedo[1], P. Provencio[1]. [1]*Clinica Puerta de Hierro, Medical Oncology, Madrid, Spain;* [2]*Clinica Puerta de Hierro, Internal Medicine, Madrid, Spain*

Introduction: Hodgkin's disease is curable in a high percentage of patients, although exists an increase mortality in patients who suffered this disease with regard to general population. This variation could be caused by previous treatment.
Our study try to demonstrate if the new technology and the change in the treatments over the time had changed the mortality patterns.e studied the various causes of death.
Patients and Methods: We included all patients diagnosed with HD, histologically confirmed, at the University Hospital "Clínica Puerta de Hierro" between 1967 and 2003. The patients were dividen into three cohorts: Cohort A patients treated before 1980, Cohort B patients treated between 1981–1986 and Cohort C, patients treated after 1986. Vital situation and competing risks of causes of deaths were examined in three time periods.
Results: We included 534 patients, the survival estimates at 5, 15 and 20 years were 81%, 72% and 65% respectively. The median follow-up was 9.1 years and at the close of the study 63.1% were alive and 31.8% had died. In the whole cohort the most common cause of death was the progress of Hodgkin's disease, followed by death due to a second tumor. At the analysis by periods, there were statistically significant differences between cohort A and the other two. Combined treatments, advanced stages and LD and MC histology were less frecuent after 1980. Survival was worse in cohort A with statistically significant difference ($P < 0.001$). However the main cause of death was tumor progression independently of the time period analyzed.
Conclusions: The main cause of death was Hodgkin's disease progression. A clear reduction in death related to the toxicity of treatments was seen over time. Patients die now for reasons that are different from in the 1970s and this is important when planning preventive and clinical research activity. So, the question is posed as to whether the survival and causes of death series for these patients are telling us about a real situation.

6028 POSTER

Late-onset neutropenia is infrequent and self-limiting in patients with diffuse large B-cell lymphoma in complete remission following therapy with rituximab in combination with chemotherapy

R. Quek[1], G. Lai[1], M. Tao[1], A. Chan[2], F. Gao[3], S.P. Yap[4], S. Loong[4], L. Tan[5], I. Sng[5], S.T. Lim[1]. [1]*National Cancer Centre Singapore, Department of Medical Oncology, Singapore, Singapore;* [2]*National University of Singapore, Department of Pharmacy, Singapore, Singapore;* [3]*National Cancer Centre Singapore, Clinical Trials and Epidemiological Sciences, Singapore, Singapore;* [4]*National Cancer Centre Singapore, Department of Radiation Oncology, Singapore, Singapore;* [5]*Singapore General Hospital, Department of Pathology, Singapore, Singapore*

Background: Recently, studies suggested that late-onset neutropenia (LON) is common in patients receiving rituximab-containing chemotherapy and is associated with high rates of infection. However, these studies were heterogeneous and included patients with different histologies, chemotherapy regimens and treatment intent, making it difficult to draw any firm conclusions. We aim to (1) study the incidence of LON in a uniform group of patients with diffuse large B cell lymphoma (DLBCL), in complete remission (CR) following curative 1st line therapy (2) to evaluate its clinical relevance with respect to life threatening sepsis and (3) ascertain any predictive factors for its occurrence.
Materials and Methods: We reviewed all patients with DLBCL treated in National Cancer Centre Singapore from March 2003 to August 2006, in CR following CHOP-like chemotherapy with or without Rituximab, and identified cases with LON as defined by the neutrophil count of $<1.5 \times 10^9$/L, without an apparent cause, after the recovery of neutrophil count following completion of the intended chemotherapy.
Results: Amongst these 115 patients identified, 85 (74%) received Rituximab in-combination with CHOP-like chemotherapy. The median number of cycles of Rituximab was 6. At a median follow-up of 24.6 months (range, 5.0 to 46.6 mths), 15 (18%) in the Rituximab group developed LON as compared to none in those not receiving Rituximab. The median time to neutrophil nadir (grade 3 and 4 in 8 and 3 patients, respectively) was 3.3 months (range, 1.3 to 8.6 months). Development of LON was associated with one episode of non-life threatening bacterial culture-positive urinary tract infection and pulmonary tuberculosis in the same patient; no other serious infectious episodes were documented. Filgrastim was administered in one patient. Neutrophil recovery occurred in all but 2 patients, at a median of 5.8 months (range, 1.4 to 11.4+). Univariate analysis including age, stage, lactate dehydrogenase, initial bone marrow involvement and number of Rituximab cycles, were not predictive for LON.
Conclusions: Our study shows that grade 3−4 LON is an infrequent occurrence (13%) in DLBCL patients receiving chemo-immunotherapy. Our data suggests that it is self-limiting and not associated with life-threatening infections. These results are important and reassuring, as DLBCL is the most common lymphoid neoplasm in clinical practice and Rituximab is invariably used.

6029 POSTER

High-dose sequential chemotherapy followed by autologous stem cell transplantation in relapsed and refractory lymphomas. Sixteen years experience of a single center

G. Koumakis[1], N. Tsoukalas[1], D. Tryfonopoulos[1], S. Demiri[1], M. Vassilomanolakis[1], V. Barbounis[1], S. Droufakou[1], I. Filis[1], M. Moraki[2], A. Efremidis[1]. [1]*Agios Savvas Anticancer Hospital, 2nd Dpt Medical Oncology, Athens, Greece;* [2]*Agios Savvas Anticancer Hospital, Blood transfusion Dpt, Athens, Greece*

Background: Traditionally high-dose (HD) chemotherapy of refractory lymphomas (Hodgkin and non-Hodgkin) consists of a single cycle of chemotherapy. In 1990 Gianni, et al. proposed sequential infusion with high doses of effective regimens as a conditioning and simultaneously therapeutic part of a megatherapy program which showed high response rates in refractory Hodgkin lymphomas. The aim of this study was to investigate the applicability of the sequential high dose therapy program in patients with refractory lymphomas as well as to estimate the therapeutic profit compared to single cycle megatherapy and transplantation.
Materials and Methods: Fifty patients (median age 38 years, range 16−60) (23 females, 27 males) who suffered from Hodgkin (20) and non-Hodgkin lymphomas (30) were enrolled. All patients had received conventional chemotherapy +/− radiotherapy and presented primary refractory disease or relapse within the first 12 months since the first treatment. Peripheral blood stem cells (PBSC's) were mobilized with HD-CTX 6 g/m^2 and growth factor successfully in all patients. Upon hematologic recovery they received sequentially HD-VP16 1400 mg/m^2, HD-MTX 8 g/m^2, HD-VCR 1.4 mg/m^2 and HD-Cisplatin 120 mg/m^2. Finally they received high dose chemotherapy with BEAM (BCNU 300 mg/m^2 D1, Etoposide 200 mg/m^2 D2−5, Aracytine 200 mg/m^2 D2−5 and Melphalan 140 mg/m^2 D6). After 72 hours from the end of chemotherapy PBSC's were reinfused.
Results: Overall response rate was 86% [28 (56%) complete remission (CR) and 15 (30%) partial remission (PR)] while seven patients (14%) presented deterioration (PD). Specifically, from patients with Hodgkin disease 11 (55%) presented CR, 5 (25%) PR and 4 (20%) PD, while from patients with non-Hodgkin lymphoma 17 (56.67%) presented CR, 10 (33.33%) PR and 3 (10%) PD. Toxicity was manageable. The mean overall survival (OS) was 105.95 months (SE = 13.61) and the mean time to progression (TTP) was 97.7 months (SE = 13.7).
Conclusion: Sequential high dose chemotherapy followed by autologous stem cell transplantation is effective in patients with lymphomas refractory to conventional therapies and probably is better than classical programs with single cycle megatherapy and transplantation.

6030 POSTER

Different decrease pattern of FDG uptake after 1 cycle chemotherapy in NK T-cell lymphoma: comparison with diffuse large B cell lymphoma

S. Kim[1], B.S. Kim[2], S.J. Kim[2], J.S. Yeo[3]. [1]*Korea University Anam Hospital, Nuclear Medicine, Seoul, South Korea;* [2]*Korea University Anam Hospital, Internal Medicine, Seoul, South Korea;* [3]*Dongguk University International Hospital, Nuclear Medicine, Gyeonggi-do, South Korea*

Background: Early metabolic evaluation after 1 cycle of chemotherapy (chemo1) is accepted as a effective tool to predict outcome in patients with diffuse large B cell lymphoma(DLBL). But little is known about early

metabolic change after chemotherapy in patients with NK-T cell lymphoma (NK-T).
Purpose: The purpose was to determine the predictive value of FDG-PET after chemo1 in NK-T and compare FDG uptake pattern of NK-T with DLBL.
Method: Five patients (M:F = 5:1, 45+8.7 year) with NK-T and 14 patients (M:F = 11:14, 55.5+14.1) with DLBL were prospectively enrolled in this study from May 2005 to February 2007. The protocol was approved by Institutional Review Board and all patients gave informed written consent. F-18 FDG PET/CT was performed before (baseline) and after chemo1. FDG uptake pattern was evaluated by two aspects: metabolic activity (MA) and metabolic size (MS).
(1) For MA evaluation, we acquired maximum standardized uptake value (maxSUV) of the lesion and calculated the corrected SUV (SUVcor) by subtracting the SUV of surrounding normal tissue from maxSUV of lesion. The decrease rate of SUVcorr after chemo1 [MA(%)] was calculated as $[MA(\%)] = [(SUV1 - SUV2)/SUV1] \times 100$, where SUV1 is baseline SUVcor and SUV2 is SUVcor after chemo1.
(2) Metabolic size was calculated by multiplying the perpendicular diameters of tumor in largest tumor size section. The decrease rate of metabolic extent after chemo1 [ME(%)] was calculated as $[ME(\%)] = [(MS1 - MS2)/MS1] \times 100$, where MS1 is baseline MS (cm^2) and MS2 is MS after chemo1.
Result: A total of 52 regions of interest(ROIs) [23 NK-T(n = 5), 42 DLBL(n = 15)], were evaluated in 19 patients. (1) In 23 NK-T, SUV1 ranged 3.9 to 7.6 (mean 5.7; SD 1.0), SUV2 3.9 to 7.5 (mean 5.6; SD 1.0), MA(%) 0.2 to 2.7 (mean 1.1; SD 0.8). MS1 1.5 to 6.0 (mean 3.5; SD 1.4), MS2 0.4 to 3.3 (mean 1.9; SD 0.1), and ME(%) 16.6 to 75 (mean 45.7; SD 17.2). 2) In 42 DLBL, SUV1 ranged 2.5 to 19.8 (mean 9.7; SD 2.2), SUV2 1.9 to 6.5 (mean 3.9; SD 1.2), MA(%) 1.3 to 72.1 (mean 61.2; SD 11.8). MS1 2.19−10.45 (mean 5.26; SD 2.02)cm2, MS2 0 to 0.78 (mean 0.21, SD 0.23)cm2 and ME(%) 91 to 100 (mean 96, SD 3.06). There were significant difference of the MA(%) and ME(%) between NK-T and DLBL ($p < 0.0001$, non paired student t-test).
Conclusion: This study showed significant different pattern of changes in FDG uptake between the NK-T and DLBL after first cycle chemotherapy. NK-T showed less prominent FDG uptake decrease after 1 cycle of chemotherapy compared to DLBL

6031 POSTER

ULISES: efficacy of epoetin beta in anaemic patients with B-cell lymphoproliferative malignancies

P. Giraldo[1], S. Ferrer[2], A. Lopez-Hernández[3], J.A. Marquez[4].
[1]Miguel-Servet University Hospital, Hematology Department, Zaragoza, Spain; [2]Dr Pesset Hospital, Hematology Department, Valencia, Spain; [3]Val d'Hebron Hospital, Hematology Department, Barcelona, Spain; [4]Basurto Hospital, Hematology Department, Bilbao, Spain

Objective: To investigate the effect of epoetin beta on hemoglobin (Hb) levels, transfusion need and quality of life (QoL) in anemic patients with B-cell lymphoproliferative malignancies.
Methods: Open-label, multicenter, prospective, non-comparative trial. Overall, 35 evaluable patients from 20 centers in Spain were recruited. Eligible patients were ⩾18 years of age with Hb$^{®}$) 30 000 IU subcutaneously (SC) once weekly for up to 52 weeks. Adverse events and vital signs were monitored throughout. Efficacy endpoints included the proportion of patients responding to epoetin beta (Hb increase ⩾1 g/dL within 8 weeks), time to attain a Hb increase ⩾2 g/dL, transfusion need at 8 weeks and change in health-related QoL score at 8 weeks based on the Functional Assessment of Cancer Therapy-Anaemia (FACT-An) questionnaire (possible values 0–188).
Results: Patients were predominantly male (60.0%), of mean age 64.8 years, mean weight 68.9 kg. The distribution by diagnosis was 17 NHL-DLBL (48.6%), 7 NHL-SLL (20.0%), 6 NHL-FL (17.1%), 4 NHL-MC (11.4%), more than one third of patients (31.4%) had a clinical diagnosis of stage IVB. Mean baseline Hb was 10.0 (±0.7) g/dL. The average duration of epoetin beta treatment was 120.2 days (range 42–347). At weeks 4 and 8, median Hb levels significantly increased with epoetin beta from 10.0 g/dL at baseline to 11.2 (±1.6) g/dL at week 4 and was maintained at 11.2 (±1.7) g/dL at week 8 (both $p < 0.001$). At the final visit, Hb levels increased to 12.3 (±1.6) g/dL. An Hb increase ⩾1 g/dL within 8 weeks was attained by 58.5% of patients; while an Hb increase ⩾2 g/dL was achieved by 64.7% of patients (mean 7.9 weeks). Overall, 29 (83%) and 31 (92%) patients remained transfusion-free at week 4 and week 8, respectively. The FACT-An QoL score improved from 120.6 at baseline to 122.5 at week 8, although this was not significant. Adverse events were generally mild and transient and no unexpected changes in vital signs were reported.
Conclusions: Epoetin beta 30 000 IU SC once weekly is an effective and well tolerated therapy for the treatment of anemia in patients with B-cell lymphoproliferative malignancy. Epoetin beta also provides significant reduction in transfusion need, a key criterion according to current 2006 European Organization for Research and Treatment of Cancer guidelines.

6032 POSTER

The immunohistochemical expression of BCL-2 to identify subgroups with different prognoses in diffuse large B-cell lymphoma

M. Carvalho[1], C.S.C. Chiattone[1], R.A.P.P. Paes[1], F.S. Soares[2], K.B.R. Ribeiro[3]. *[1]Hematology And Oncology Department Of The College Of Medical Sciences Of Santa C, Oncology, São Paulo, Brazil; [2]Accamargo Hospital, Pathology, São Paulo, Brazil; [3]FCMSCSP, Stathistics, São Paulo, Brazil*

Introdution: Diffuse large B-cell lymphoma (DLBCL) is a heterogeneous disease, clinically and morphologically, reflecting a mixture of underlying biologic or genetic differences. Therefore, it is important to identify at diagnosis biological markers which allowed determination of subgroups with favourable or unfavourable evolution.
Objective: The goal of this study was to evaluate the impact of BCL-2 tumor expression on overall survival (OS) in germinal center B-cell (GCB) and non-GCB, in patients with DLBCL, respectively.
Cases and Methods: Seventy four untreated pts (median age: 59 yrs: 39M/35F) with DLBCL de novo diagnosed in a single institution, treated with CHOP-like regimens. median follow-up time of 16 months and average of 27.5 months, with 63% presenting nodal disease tissue microarrays (TMA) blocks were created from paraffin-embedded, formalin-fixed block and stained with antibodies to CD10 (clone 56C6; Novocastra; NCL-CD10–270), BCL-6 (clone GI 191E/A8; Cell Mark; CMC 798), MUM1 (clone MUM1p; Dako, CA; M7259) and BCL-2(clone 124, Dako, M0887).
Results: Tumor expression of BCL-2 (cutt off 10%), by TMA, was seen in 45% and was associated with a worse OS ($p = 0.03$). Tumor expression of BCL-2 for the group GCB was not associated with a significantly longer OS ($p = 0.58$), whereas tumor expression of BCL-2 for the group non-GCB was associated with a significantly longer OS ($p = 0.02$).
Conclusion: The BCL-2 expression within the NGC presented an unfavorable impact on the outcome, which was not observed in the GC.

6033 POSTER

Treatment of non-Hodgkin lymphoma of the Waldeyer's ring

N. Sousa[1], T. Jaraquemada[2], M. Juan[1], I. Oliveira[2], A. Martins[2], L. Viterbo[2], P. Teixeira[2], M. Marques[2], M. Mariz[2]. *[1]Instituto Portugues de Oncologia, Oncologia Médica, Porto, Portugal; [2]Instituto Portugues de Oncologia, Oncohematologia, Porto, Portugal*

Background: Non-Hodgkin lymphoma (NHL) can affect any organ. Up to a quarter of NHL have an extra-nodular origin. I was our purpose to evaluate the treatment of Waldeyer's ring NHL (WR-NHL) in a single comprehensive cancer centre and identify potential prognostic factors.
Material and Methods: Retrospective review of patients treated in our institution for WR-NHL between Jan/1996 and Dec/2005. Descriptive statistical analysis of clinical variables was performed as well as survival analysis by Kaplan-Meier methodology. Log rank test was used for the identification of clinical prognostic factors.
Results: Twenty-four patients (pts) were identified, 63% of them were male. The median age at diagnosis was 60 years. B-cell NHL was more commonly identified, with 20 cases of diffuse large cell lymphoma (DLCL) and 1 case of follicular cell lymphoma. Ann Arbor stage I or II was diagnosed in 16 pts (76.2%). Chemotherapy (CT) followed by radiotherapy (RT) was the treatment of choice in 13 pts, CT alone in 7 pts and RT in 1 pts. The CT regimens used were CHOP (13 pts, 1 pts rituximab-CHOP), CNOP (7 pts) and ACOB (1 pts). Complete response (CR) was achieved in 16 pts (76%), partial response in 1 pts (5%) and 4 pts (19%) had disease progression during therapy. Of those that achieved CR, 6 (37.5%) relapsed. With a median follow up of 33 months, 10 pts (47%) are alive and free of lymphoma (AFL) and 11 pts died (8 with lymphoma). The median survival was 60 months. Elevated LDH and advanced stage at diagnosis were associated with a worse prognosis.
T-cell NHL of peripheral subtype with no other specification was identified in 3 pts, all with Ann Arbor stage I disease. Two pts were treated with ACOB followed by RT and 1 pts was treated with CHOP. CR was achieved in all patients. Two relapsed, of which 1 died with lymphoma. Two pts are AFL.
Conclusions: WR-NHL is an uncommon location for primary extra-nodal NHL. In our institution, B-cell DLCL was the most frequently diagnosed subtype. The median survival was 60 months and elevated LDH and advanced stage at presentation were predictive of worse outcome.