

POSTERS

01

SEVERE PANCYTOPENIA IS AN UNCOMMON ADVERSE EVENT OF BORTEZOMIB: CASE REPORT

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Bortezomib (Velcade®) is a novel proteasome inhibitor that shown an impressive activity in relapse/refractory myeloma patients. Its antimyeloma effect exerts blocking the activation of transcription factors such as NF-κB and inducing myeloma cells apoptosis via caspasi 8 e 9.

Major adverse effects of Bortezomib (B) are trombocytopenia (40%), peripheral neuropathy (up to 50%), anemia (30%), fatigue (50%), rash (20%), neutropenia (20%), fever (34%), infection (20%), hypotension (12%), nausea and vomiting (60%). We report a case of 58 year-old caucasian man who presented relapsed multiple myeloma (IgAk, IIIA). In front line treatment, he received two courses of VAD + 2 VAC + HD-CTX (7 gr/m²) + tandem autologous peripheral stem cell transplant (MEL 200 mg/m² conditioning regimen) followed by IFN and Zolendronic Acid as maintenance therapy for 1 year. At disease relapse, Thalidomide 200 mg/day was administrated, but it was stopped after seven months for progression disease. We planned five courses of B alone, 1.3 mg/m² iv on days 1,4,8,11 q3w. Complete response (negative immunofixation, IF), according EBMT criteria, was reached after four courses. Toxicities comprised nausea, mild fatigue, hypotension and trombocytopenia. After 5th B, an uncommon pancytopenia arised and laboratory findings shown: WBC 1,160 (Neu 33%, Lym 64%, Eos 2%, Bas 1%), HB 8.1, Ht 26, MCV 96, PLTs 19.000, LDH 176, PCR 1.2, β2M 1.5, Total Prot. 6.7, Alb 61.5, α1 4.3, α2 9.5, β 10.5, γ 14.2, IgG 10.24, IgM 0.47, IgA 1.11, Ca 8.6, BUN 24, Creat 0.7, serum and urine IF negative, serum and urine free light chains and κ/λ ratio normal, folate and Vit. B12 normal, IAT and DAT both negative. Bone marrow biopsy shown marked hypocellularity, megakaryocyte numbers reduced, myeloid and erythroid hypoplasia without dysplastic features, plasma cells virtually absent. After three weeks, in wich patient was supported with blood transfusions and G-CSF 5μg/Kg/day, pancytopenia self limited spontaneously. Subsequently, patient underwent peripheral stem cell collection following HD Ara-C (4 gr/m²/day IVCI for three days) plus G-CSF CD34⁺ stem cell collection was 2.7×10⁶/Kg and 3th autotrasplant is in planning. Conclusions: isolated trombocytopenia, anemia or neutropenia are described as indesiderable effects of B. Otherwise, trombocytopenia B correlated is not associated with reduction of megakaryocytes in bone marrow, but it depends by lack platelets fragmentation and release. In our case, a reversible, self limited pancytopenia due to B, in a CR patient, was associated to severe trilineage bone marrow hypoplasia and, probably, to an important microenvironment overthrow.

02

DIAGNOSIS AND MONITORING OF LYMPHOPROLIFERATIVE DISORDERS USING SERUM FREE LIGHT CHAIN ASSAYS

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Introduction. Here we describe two investigations currently in progress: in one the benefit of adding serum free light chain (sFLC) assays to a primary screening protocol for lymphoproliferative disorders was investigated. In the second, the utility of the assays for rapid assessment of response to treatment was determined.

Patients and Methods. For the screening study, sera from 971 patients, referred for investigation of potential lymphoproliferative disorders, were assessed initially by serum protein electrophoresis (urine samples were available for 72 patients) and retrospectively by sFLC assays. For the monitoring study, serial serum samples were collected from 8 patients being treated (Bortezomib; 1.3 mg/m²) for relapsed multiple myeloma. sFLC results were compared with measurement of intact immunoglobulins.

Results. Of the 971 sera in the screening study, 850 were normal by SPE. Of these, 36/850 had abnormal sFLC ratios and serum IFE identified monoclonal immunoglobulins in 4/36. Reviewing the case notes for the remaining 32 patients (serum IFE normal/sFLC abnormal) revealed 3 diagnoses of multiple myeloma and 2 of chronic lymphocytic leukaemia. Of the remaining patients, 2 had chronic kidney disease, 2 chronic infection and 1 fibroadenoma, others are still under investigation.

Of the 8 patients monitored, six showed a response to therapy. In 3 of these, the tumour sFLC showed repeated falls and rapid recovery within 10-20 days of treatment cycles, which was not shown by the intact immunoglobulin. Generally the sFLC levels indicated response earlier and in two patients, response was seen significantly earlier (30 and 70 days). In one remaining patient, intact immunoglobulin showed disease response whereas sFLC showed no response and subsequently disease progression.

Discussion. In this screening study, the sFLC assays identified at least 9 extra patients with lymphoproliferative disease. Addition of sFLC analysis provided improved detection, particularly for those patients who did not provide urine samples.

For monitoring, sFLC measurement provided a unique opportunity to follow the kinetics of tumour kill, which is obscured by the slow clearance of intact immunoglobulins. The fluctuation of sFLC levels suggests a temporary inhibition of tumour protein synthesis rather than tumour kill and re-growth. The results show that sFLC can be used to assess response to treatment earlier and possibly indicate when changes of treatment are appropriate.

03

RADIOTHERAPY IS NOT NECESSARY TO CURE HODGKIN'S LYMPHOMA

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Background. The observation of late risks of developing second tumours and coronary heart disease after radiotherapy has led to a reduced utilization of radiotherapy in front line treatment. There is some evidence that early stage HL patients are likely to be cured by 3-6 courses of ABVD, with radiotherapy being utilized only on limited residual disease.

Methods and patients. We reviewed clinical features, therapy and long term outcome of 45 HL patients diagnosed and followed in our centre from 1995 to 2005. The most prevalent histological subtype was nodular sclerosis (85%, 38 patients). Clinically, 2 (4%) had stage I disease, 26 (58%) stage II, 5 (11%) stage III and 12 (26%) stage IV. B symptoms have been recorded in 24 patients (53%).

Results (all patients). First line therapy consisted of ABVD in 32 patients (71%), ABVD/MOPP in 10 (22%), ABVD followed by IEV and HDT in 3 (7%). After chemotherapy alone CR was achieved in 36 patients (80%) and PR in 9 (20%). After high dose therapy (HDT) and or radiotherapy (RT) CRs increased to 42 (93%). Median duration of DFS and overall survival have been 41 months (range 3-120) and 48 months (range 9-124), respectively. Relapse has been recorded in 5 patients (12%). All these patients obtained second CR after salvage chemotherapy or HDT. Forty-four patients are alive, 1 has died of disease. A second neoplasia has been diagnosed in 3 patients (2 of these had received radiotherapy).

Results. (stage I-II patients). Two patients in stage I and 25 in stage II received a median of 3 and 6 courses of ABVD, respectively. One patient was treated with the combination of MOPP/ABVD and radiotherapy. Twenty-five patients achieved CR. Two out of the 3 partial responders achieved CR after RT. Twenty-seven patients overall (96%) achieved CR. Median duration of CR and survival have been 30 months (range 2-103) and 37 months (range 7-104), respectively. Two stage II B patients have relapsed at 7 and 8 months and obtained second CR after HDT. By now all patients are alive, 27 are disease free.

Conclusions. The retrospective analysis of our series shows that long term control of HL may be achieved with a limited utilization of radiotherapy, regardless of stage.

04

SERUM FREE LIGHT CHAINS: A POTENTIAL USEFUL MARKER FOR DIAGNOSIS AND EARLY ASSESSMENT OF RESPONSE TO TREATMENT AND RELAPSE IN PLASMACELLS DISORDERSGiarin MM,¹ Giaccone L,¹ Bruno B,¹ Omedè P,¹ Battaglio S,¹ Falco P,¹ Hila I,¹ Fiore F,¹ Di Bello C,¹ Amoroso B,² Boccadoro M,¹¹Az. Osp. San Giovanni Battista di Torino, Ematologia 1U, Turin, Italy; ²The Binding Site, Rome, Italy

Introduction. We investigated a possible role of serum Free light chains (sFLC) as a useful marker in diagnosis and early monitoring of disease course and response to treatment in a small group of patients with PD. Besides, we evaluated a predictive role of sFLC in MGUS.

Patients and Methods. Serum protein electrophoresis (SPE), immunofixation (IFE), sFLC and plasma cell count

(PCC) were performed at diagnosis and during follow up in 28 patients. All patients were treated with conventional therapies, including thalidomide-desamethasone (TD), DT-PACE Hybrid, MPR (melphalan-prednisone-revlimid) and autologous stem cell transplantation (ASCT).

Results. -IIMM: sFLC were abnormal in all patients (n=6) at presentation. sFLC decreased earlier than intact immunoglobulins in all responding patients and PCC reflected sFLC alterations. One patient thalidomide-desamethasone resistant and subsequently treated with DT-PACE Hybrid, showed a rapid decrease in sFLC, that significantly correlated with response to second-line therapy. In 2 IgG hyposecretory patients treated with MPR, sFLC and ratio progressively decreased indicating response to treatment whereas total IgG were almost unvaried. LCMM: in all 5 patients, at the time of diagnosis, the presence of monoclonal paraproteins could also be detected by mean of sFLC. After treatment sFLC remained abnormal in 2 patients, whereas no urine BJP were detectable. Relapse was always indicated by a rapid increase of sFLC. NSMM: In all patients (n=4), at clinical presentation, serum and urine IFE was negative, while sFLC and ratio were abnormal. During follow up a correlation between sFLC, PCC and clinical events was observed. AL amyloidosis: in both patients with renal amyloidosis a 50% reduction of baseline sFLC correlated with response to therapy, chemotherapy in one and ASCT in the other. MGUS: All but one patient with progressing MGUS (n=5) showed abnormal sFLC and ratio, at the onset of MM; in all of them was observed a rapid increase of sFLC and ratio correlating with progression to MM. All MGUS (n=6) with stable disease showed normal sFLC and ratio at diagnosis and in follow-up.

Discussion. The early fall or rise of sFLC (or their ratio) accurately monitored response to therapy and suggested relapse long before any Ig or pBJ variation became apparent; the higher sensitivity is directly correlated to their short half-life (2-6h). sFLC proved to be an useful tool for diagnosis and management of ipo-secretory MM, NSMM and AL amyloidosis, and showed a significant correlation with PCC. Abnormal sFLC and ratio were associated with a higher risk of progression in MGUS.

05

REVERSIBLE POSTERIOR LEUCOENCEPHALOPATHY SYNDROME: A COMPLICATION TO BE CONSIDERED

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Introduction. Reversible Posterior Leucoencephalopathy Syndrome (RPLS) is a recently recognized cliniconoradiological entity characterized by headache, impaired mental status, cortical blindness, seizures and other focal neurological signs. Imaging is characterized by magnetic resonance (RM) and Computer tomography (TC) specific findings. RPLS has been reported in association with hypertension, immunosuppressive and chemotherapy agents. With early diagnosis and prompt treatment the syndrome is usually fully reversible. We describe two retrospective cases of RPLS in NHL over the past 10 years at our Department of Pediatrics (Spedali Civili di Brescia).

Case 1. A 5 years old boy who presented with non-Hodgkin lymphoma, received intrathecal methotrexate-ARAC-Prednisone (TTT) during the first cycle, as stated in the LNH-97 AIEOP protocol. On day 15, he developed acute confusional state, hyporeflexy, generalized seizure, nystag-

mus without hypertension. This syndrome lasted for 4 hours and completely recovered with anticonvulsant therapy and discontinuation of chemotherapy. TC done on the same day showed hypodensity in bilateral parietaloccipital regions. Subsequent treatment was performed according to the original treatment protocol except for TIT that was discontinued since the neuroradiological resolution, one month later.

Case 2. A 10 years old girl, presenting with NHL B large cell that complicated a form of myelodyslasia, was treated with CHOP protocol and rituximab; after the second cycle she developed seizure and coma with hypertension (160/100 mmHg) lasting for a few hours. The day after she presented two seizure attacks with hypertension, psychomotorial disturbances, dysphoria. RM imaging demonstrated cortical and subcortical lesions in the parietal-occipital region, consisting in high intensity signal on T2-weighted. She completely recovered with anticonvulsant, antihypertensive therapy and discontinuation of chemotherapy.

Conclusions. We can hypothesize that in the first case RPLS was caused by TIT. Since MTX ev and ARA-C were not given at high doses, RPLS is most likely to have been induced by TIT, as also reported in other cases from literature. In case 2 it is likely that RPLS has been induced by hypertension and immunosuppressive therapy. Early recognition of RPLS during cancer therapy in children may facilitate diagnosis and treatment and could prevent persistent neurological sequelae.

06

BORTEZOMIB ASSOCIATED TO DEXAMETHASONE IN PATIENTS WITH RELAPSED/REFRACTORY MULTIPLE MYELOMA

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Background. Bortezomib is a proteasome inhibitor that has been shown to be effective, obtaining durable responses when given as monotherapy for relapsed or refractory multiple myeloma (MM), without severe toxicity. The latest studies prove a 38% of response rates in patients that had received 1-3 prior treatment schedules.

AIM: To evaluate the efficacy in patients with relapsed or refractory multiple myeloma that received bortezomib plus dexamethasone after two or more prior therapies. We evaluated toxicity and overall survival as well.

Patients and methods. We analyzed 30 patients from various hospitals of Malaga with MM treated with standard dose bortezomib (1.3 mg/m² given on days 1, 4, 8 and 11 in a 21 day cycle), every 3 weeks plus dexamethasone 40 mg(m² on day 1) with a 15.5 month period follow up (median 10.5 month, range 2.5-15.5). We included 18 males and 12 females with mean age 57.26 (range 37-72). The prognostic markers at time of diagnosis were $\beta 2$ microglobuline > 3 in 38 % of patients, median of plasma cells in bone marrow 37.56%, extramedullary involvement 23%. The median number of prior therapies was 2.9 (range 1-7) and 30% of patients had undergone prior autotransplant.

Results. The response was evaluated according to the EBMT criteria in 22 patients (74%) with a media of 5 cycles completed of treatment (1-10). The evaluation at 4^o cycle was: complete response (CR):0; near complete response

(CnR): 19.2%; partial response (PR): 41%; minimal response (MR): 13.6%; stable disease (SD): 13.6%; Progression: 13.6%. At the end of the treatment (with a media of 7 cycles) 10 patients had been evaluated (33%); obtaining the following responses: CR:20%; CnR: 40%; PR: 30%; MR: 10%. Overall survival 80%. Toxicity profile WHO grade 3-4: thrombocytopenia: 33%; neuropathy 37%; gastrointestinal: 17%; zoster herpes virus infection:17%. In 47% of patients a dose reduction was required.

Conclusions. Bortezomib is an effective agent with acceptable toxicity for the treatment of patients with relapsed/refractory MM. The response rates, overall survival and toxicity in our series is similar to data described in previous studies although a longer follow up is needed in order to confirm these results.

07

USEFULNESS OF SERUM FREE LIGHT CHAIN ASSAY IN PREDICTING RESPONSE TO CHEMOTHERAPY IN PATIENTS AFFECTED BY MULTIPLE MYELOMA

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We investigated if baseline sFLC concentration and κ/λ ratio could be predictive for response to therapy in patients treated with thalidomide, dexamethasone and pegylated liposomal doxorubicin (ThaDD). Of 115 patients (pts) treated with ThaDD, 15 (mean age 71 years; range 57-80) were tested for sFLC prior to chemotherapy initiation and assessed for response. $\beta 2$ -microglobulin median concentration was 4.05 mg/L (range 1.5-20 mg/L), serum albumin 3.78 mg/dL (range 3.1-4.5 mg/dL), serum creatinine 1.05 mg/dL (range 0.7-12.2 mg/dL) and PCR 1.55 mg/L (0.30-6 mg/L). IgG was detected in 7 pts, IgA in 2, light chain in 6 cases with monoclonal protein median concentration 3027 mg/dL (1480-5260 mg/dL). 13 pts were κ positive and 2 λ positive, median concentration 600 mg/L (range 56.5-8000 mg/L) and median κ/λ ratio 400 mg/L (range 16-6090). Post-chemotherapy (6 cycles), 3 patients were CR, 10 PR and 2 MR as per EBMT criteria. On the basis of median pre-treatment sFLC levels (600 mg/L) and κ/λ ratio (400) patients were divided in 2 groups: in one with baseline sFLC \leq 600 mg/L 3 achieved CR, 5 PR and none MR whereas in the group with sFLC > 600 mg/L, 2 were MR, 4 had PR and none achieved CR ($p=0.048$). The same results were observed for κ/λ ratio ($p=0.048$). Other factors like age, sex, monoclonal protein, $\beta 2$ -microglobulin, serum albumin, ISS, creatinine and PCR, all evaluated at baseline, did not predict response rate. In addition, elevated sFLC and κ/λ ratio values were significantly associated with both high serum $\beta 2$ -microglobulins and low albumin levels. Furthermore sFLC showed a more likely correlation with ISS ($p=0.031$) than κ/λ ratio ($p=0.091$), whereas no correlation was observed between sFLC and monoclonal protein concentrations. Our preliminary data suggest that baseline sFLC level and κ/λ ratio could be useful either as indicators of tumor mass or have a role in predicting response to treatment in patients with multiple myeloma.

08

A RITUXIMAB MAINTENANCE SCHEDULE IN PROLONGATION IN FOLLICULAR NON-HODGKIN LYMPHOMA

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Introduction. Preceding studies have shown that Rituximab (R) prolongs the time to treatment failure (TTF) and response duration (RD) in follicular lymphoma (FL) when given either together with chemotherapy or as maintenance after therapy. Until now only has evidence about benefit of R maintenance in patients previously treated with chemotherapy that not included R. The best schedule of maintenance with R it is not defined now. Aim of study: to evaluate the efficacy of R as maintenance in FL patients previously treated with a schedule that included R. Design: observational, prospective trial in a previously patients with FL treated with chemotherapy plus Rituximab were eligible in complete remission (CR).

Patients and methods. Since January 2002 to December 2005, 29 previously treated FL grade I or II patients with one R-chemotherapy line were included. At diagnosis baseline assessment: age, gender, clinical and physical exam, blood counts, serum and urine biochemistry, albumin, β 2-microglobuline and LDH level, body scan, bone marrow biopsy. Patients were classified according ECOG, clinical stage and FLIPI. Patients in complete remission (CR) after chemotherapy receive Rituximab 375 mg/m² x 4 weekly every 6 months for 2 years. Re-staging studies were performed every cycles: CR, partial remission (PR) and relapse (R). Toxicity events have been noted. Statistical analysis: Overall survival (OS), relapsed free survival (RFS). Survival analysis were performed using Kaplan-Meier and Cox regression.

Results. Mean age 52.2 (35-69), male 71.5%; ECOG 0 (57%), 1 (14%), 2 (28%); B symptoms 28%; FLIPI score 0 (14%), 1 (42.7%), 2 (14.2%), 3 (28.5%); stage II (42.7%), IV (57%); grade I (28%), II (71%); Bulky disease 14%; extranodal location 14%; haemoglobin < 10 g/dL (14%); high LDH 14%; high β 2-microglobuline 14%. Therapy schedules: R-CHOP (81%), R-FCM (16%), R-FC (3%). At present 14% of patients has completed two years on maintenance, 14% has received 3 courses, 28% two and 1 57%. None have relapsed. Only one patient was excluded by grade 3-4 neutropenia. No other severe adverse events have been observed. Treatment has been well tolerated without allergic reactions.

Conclusions. R maintenance seems to be effective in FL. It is necessary a longer follow-up to consider the magnitude of the effect obtained with R maintenance.

09

RESPONSE IN RELAPSED REFRACTORY MYELOMA RECEIVING BORTEZOMIB

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Background. Bortezomib has been shown to be effective in multiple myeloma (MM). Aims: To evaluate the efficacy of Bortezomib in refractory relapsed MM. Patients and methods: 34 patients with relapsed MM. Bortezomib (1,3 mg/m² on days 1,4,8,11 in a 21-day cycle) were administrated. **Response.** CR: without symptoms, no monoclonal component (MC) detected by immunofixation electrophoresis (IFE)

(Sebia standardized procedure), PR: reduction of MC >50%, Minimal Response(MR): reduction of MC 25-50%, Clinical response (Clin R): no clinical symptoms, and non-response(NR). Adverse effects were registered. Results: 34 patients (males 41.7%), mean age 60 years (35-74), over 65 years (50%). Previous therapy: 1 schedule: 5 (15.4%), 2: 10 (30.7%), 3: 17 (50%), 4: 1 (3.8%). For the analysis 26 patients were valuable.

Response. 76.9%: (CR+PR 65.4%), (CR 46.1%), (CR-IFE negative 23.0%), (PR 19.2%), (Clin R 11.5%). Mean courses to reached response: 3.6. No relation to response and presence or not chromosomal aberrations. At 24 months on follow-up 7 patients had dead (20.6%) and 11 (42.3%) maintained response without therapy. In 11 patients (42.3%) a combination of Bortezomib+Dexa or Melphalan were administrated by relapse or progression. Adverse events: Thrombocytopenia 46.1%, fatigue 38.5%, peripheral neuropathy 30.8%, constipation 23%, diarrhea 15.4%, ZHV 15.4%, pneumonia 15.4%, pyrexia 7.8%, hypotension 15.4%, grade 3 leucopenia 7.8%. In 2 patients (15.4%) the therapy was disrupted by toxicity.

Conclusions. Bortezomib in monotherapy induce a high rate of response (76.9%) in refractory MM. The response is achieved in the first 4 courses. It is recommendable to make combinations after the 4th course of Bortezomib if response does not achieved. No severe adverse effects have been observed.

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RADIATION PNEUMONITIS IN PATIENTS TREATED FOR HODGKIN'S DISEASE

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At present, in the treatment of Hodgkin's disease (HD), on the base of results obtained with radiotherapy (RT) and those gotten with different treatment modalities, the problem that it emerges is that to seek the treatment that also maintaining a tall percentage of care, offers small late effects. Despite the RT has represented, for about 30 years, the treatment of choice of the initial stage of the HD, evidence has shown that 20-30% of the patients shows non malignant iatrogenic sequelae treatment-related: thyroid dysfunctions, X-rays-related asymptomatic pulmonary fibrosis, radio-induced pneumonia, pleuritis, cardiac events and gonadal dysfunctions.

In the patients with HD treated with the mantle-field a considerable portion of the pulmonary parenchyma is included in the irradiated volume. The radiation pneumonitis is the pulmonary answer to the insult of the radiation; it rises up 2-3 months after the mantle irradiation and it is manifested as an infiltrated pulmonary, generally in the field of irradiation. Its severity is correlated with the volume of lung irradiated, the total dose of radiation, the dose rate, the techniques and the quality of the radiation, the association with chemotherapy (CT) and still from indefinite factors tied to the guest that have effect on the extension of the reaction of the normal tissues to the irradiation. Around 23% of the patients essays with mantle-field shows some radiological signs of X-rays-related asymptomatic pulmonary fibrosis and radio-induced pneumonia. In the majority of the cases it did not require additional therapy, while only 25% it requires medical treatment. The incidence of the pulmonary toxicity from RT, CT, and combined treatments has recently been studied in numerous series. All authors agree that the pulmonary insult is essentially correlated with

the mantle irradiation and can slightly be increased by CT containing bleomycin and that the fractions of RT > 2 Gy can increase the pulmonary functional damage, especially after combined therapy. Goes however affirm that all the performed analyses are reported to historical periods in which the dose for fraction was not for instance well established.

The future goal of treatment of HD should be addressed to reduce the long-term toxicity while maintaining a high disease-free without altering survival. This is especially basic in these young patients population, which the treatment side-effects may have important consequences on the quality of life. The lack, then, of randomized studies on the effects on the quality of the life of the iatrogenic sequelae in the HD patients, the proposed treatment must have founded on a rigorous evaluation of the morbidity correlated, early and late. And last but not least a important conclusion that the need for an accurate surveillance programme of patients suffering from HD in order to recognize the morbidity of treatment early, minimise it and to assess their incidence.

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LYMPHOPROLIFERATIVE DISORDERS IN CHILDREN AFFECTED BY PRIMARY IMMUNODEFICIENCIES

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Inherited immunodeficiencies are a group of heterogeneous syndromes characterized by defects of cellular and/or humoral immune responses. The severe forms of PID can lead to death within the first decade because of development of acute or chronic infections and to their consequences. Cancers, and more in particular lymphoproliferative disorders, are the second most common cause of mortality among patients with primary immunodeficiencies. The underlying conditions that predispose these patients to the development of lymphoproliferative disorders are: 1) the insufficient function of immunosurveillance due to alteration of the proliferation and/or function of lymphocytes; 2) genetic deregulations that promote the expression of malignant oncogenes; 3) increased susceptibility to Epstein Barr virus (EBV) infection. The Pediatric Department of Brescia, that is the national referent center for the diagnosis and the treatment of primary immunodeficiencies, has reviewed the registered patients with inherited immunodeficiency who developed cancer. A retrospective survey on patients with primary immunodeficiency revealed several patterns of increased risk for specific cancer types. We report 11 PID patients who were diagnosed and treated for cancer in this department between 1990 and 2005. The overall number of PID patients observed in the same period was 600. Out of the 11 children affected five had CVID: two developed LNH, two LH and one surrenalic cancer, followed by skin lymphoma. One SCID patient developed EBV correlated B-lymphoma. Of the three patients affected by X-linked Agammaglobulinemia, one developed LLA pre-B, the second gastric cancer while the last one thyroid cancer. One patient suffering from Wiskott Aldrich Syndrome (WAS) presented a LH with a cerebral involvement; a child with Ataxia Telangiectasia developed LNH. At present only three of these patients are still alive, while the remaining, despite treatment, deceased. Our results show that patients suffering from primary immunodeficiencies have an increased risk of develop-

ing cancer. The worst prognosis of these children seem to be due both to the major aggressiveness of tumour cells in this cohort of patients and to the impossibility to treat these patients with a fairly aggressive therapy. Moreover we have observed that the above mentioned tumours in the general population have a better prognosis than in patients with PID except gastric cancer which has a low survival in both groups.

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VEBEP REGIMEN AND HIGHLY ACTIVE ANTIRETROVIRAL THERAPY IN PATIENTS WITH HD AND HIV INFECTION

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Background. The outcome of pts with HD-HIV is still poor, mainly because the duration of complete remission (CR) is short. With the aim to improve the prognosis of HD-HIV, a feasibility study with the VEBEP regimen and radiotherapy and HAART was started in previously untreated HD-HIV pts.

Methods. CT included epirubicin 30 mg/m²/day (days 1-3), cyclophosphamide 1000 mg/m² (day 1), vinorelbine 25 mg/m² on (day 1), bleomycin 10 mg/m² (day 3) and prednisone 100 mg/m²/day (days 1-3).

Results: Since September 2001, 28 have been enrolled. The median age was 39 yrs (range 28-59). The median CD4+ cell count at entry was 256/mm³ (range 44-589) and 15 pts had a detectable HIV viral load. Stages III-IV were present in 19/28 (68%) pts. Histologic subtypes were: MC 75%, NS 14%, not determined 7%, LP 4%. One toxic death was observed. An absolute neutrophil count <500 was noted in 12/28 pts (43%). Grade 3-4 anemia was observed in 8/28 pts (29%) and severe thrombocytopenia in 5/28 (18%) pts. Nine pts (32%) had febrile neutropenia with 6 documented infections in five pts. A grade 2-3 mucositis was observed in 6/28 pts (21%). CR was obtained in 21/28 pts (75%) and PR in 2/28 pts (7%). With a median follow up of 24 months, only two pts have relapsed (9%). The OS and TTF at 2 years are 86% and 68%, respectively.

Conclusions. Our preliminary data demonstrates that VEBEP regimen in combination with HAART is feasible and active in pts with HD-HIV.

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LONG TERM RESULTS OF STANFORD V REGIMEN AND HIGHLY ACTIVE ANTIRETROVIRAL THERAPY IN 59 PATIENTS WITH HD AND HIV INFECTION

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Background. The introduction of HAART has significantly improved the outcome of pts with HD-HIV. However there are no data on the long term follow-up of HD-HIV pts treated with conventional chemotherapy (CT) regimens. In 2002, we reported the results of a prospective phase II study with the intensive 12-week CT with adjuvant radiotherapy (Stanford V) and concomitant HAART in 59 pts (Spina *et al.*

Blood 2002;100:1984-1988).

Methods. To analyze the long term outcome of patients included in the Stanford V and HAART protocol.

Results. The median follow-up is 53 months (range 3-104 months). The overall survival (OS) is 59%, the freedom from progression (FFP) is 62% and the disease free survival (DFS) is 72%. The 5-year probability of OS was significantly different in pts with an international prognostic score (IPS) >2 in comparison to that of pts with an IPS <3 (84% vs 36%, $p=0.001$). Similarly, the percentages of FFP at 5 years in these groups were 72% and 45% ($p=0.03$).

Conclusions. Our data confirm the long term efficacy of Stanford V regimen in combination with HAART in HD-HIV. Stanford V is significantly less effective in pts with IPS>2 and therefore new strategies be tested in this setting.

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AM3 THERAPY IN PATIENTS UNDERGOING HEMATOPOIETIC STEM CELLS TRANSPLANTATION

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Introduction. AM3(Inmunoferon®), is a glycoconjugate of natural origin with immunomodulatory properties. Aim: To evaluate the influence of AM3 in the biological recovery of immune system (IS) in patients undergoing hematopoietic stem cells transplantation (HSCT) (autologous /allogenic). To register clinical incidences as undercurrent infections and mucositis from HSCT infusion's day to day +90 in patients with and without AM3. Patients/methods: Group A (cases): Inclusion of 19 consecutive patients undergoing HSCT. April 04-June 05. Inclusion criteria: age >18 years, first HSCT and signed consent form. AM3 dose: 20 mg/8h orally since infusion's day to +90 day. Group B (controls): 19 patients consecutively undergoing HSC, February 03-March 04. Biological evaluation of the IS recovery: WBC, immunoproteins quantification: IgG, IgA, IgM, C3, C4, lymphoid populations distribution and activity of monocyte biomarkers (chitotriosidase, CCL18/PARC) on days -7, 0, +7, +14, +21, +28, +56, +90. Clinical evaluation and comparing cases/ controls

Mean age (range)	Group A	Group B
Females (%)	44 (18-67) 6 (31%)	48 (18-68) 7 (36.8%)
Allogeneic HSCT (M/F)	4 (21%) (3M/1F)	6 (31.5) (5M/1F)
Autologous HSCT (M/F)	15 (78.9%) (10 H/5M)	13 (68.4%) (7M/6F)
Diagnosis	Acute leukemia 7 (37%), MM (37%), MD S (10%), Hodgkin disease 2nd remission 2(11%), lymphoblastic lymphoma 1 (5%)	Acute leukemia 4 (21%), MM 9(47%), Hodgkin disease 2nd remission 2(11%), NHL 4 (21%)
Mucositis	12 (63%): grade I: patient (9%); grade II: 4 (33%); grade III: 4 (33%); grade IV: 3 (15%)	17 (89.5%): grade II: patient (9%); (6%); grade III: 6 (35) grade IV 9(53%)
Infectious disease	6 (31.5%): S. Epidermidis 4(21%) St. hominis 1(5%), CMV 2(10.5%), C Albicans 1(5%)	8 (42%) St coagulase negative 7 (36.8%), Str viridans 1 (5.2%), S. epidermidis 1 (5.2), Acinetobacter junii 1 (5.2%), Ochrobactrum anthropi 1 (5.2), P. aeruginosa 1 (5.2), C diricle 1 (5.2%), ADN Herpes virus 6 2(10.5%) CMV 3 (15.7%), C. albicans 2(10.5%), C. Krusei 1 (5.2%) P. carinii 1 (5.2)

of incidence of mucositis severity according to WHO classification and microbiological documented infectious diseases. Results: Addition of AM3 in patients undergoing HSCT reduces significantly oral mucositis (63.1% vs 89.5%) ($p=0.025$), being of less complexity. Infectious diseases were lower in patients under AM3 therapy (31,5% vs 42%) ($p=0.254$) (see Table). Recovery of the IS showed a initial recuperation at day +14 in autologous HSCT and +21 in allogenic HSCT. Tolerance was satisfactory; only 2 patients needed discontinue therapy for digestive intolerance. Wide studies must be performed to evaluate benefit.

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R-FC-R IN REFRACTORY B-CLL

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Combination therapy with Fludarabine plus Cyclophosphamide (F/C) has shown superior efficacy as compared to conventional therapy (Chlorambucil, Fludarabine alone) for the treatment of B-cell chronic lymphocytic leukemia (B-CLL). Recent studies have showed that the addition of Rituximab (R) to F/C regimen has improved the Complete Remission (CR) rate in refractory or relapsed B-CLL. From April 2003 to March 2006, we have treated 19 patients with refractory or relapsed B-CLL with Rituximab 375 mg/m² days 1 and 5, Fludarabine 30 mg/m² days 2-4, Cyclophosphamide 300 mg/m² days 2-4. Two patients, who relapsed at response (1 PR, 1 CR), after 2 and 27 months respectively, were retreated with the same schedule obtaining a second response (respectively PR and CR). Evaluation of the response (CR, PR, NC, PD) was only made on clinical basis (symptoms, PS, circulating lymphocyte mass, size of lymphonodes and/or hepato/splenomegaly). Overall, 20 treatments were delivered to 18 patients obtaining 20 durable responses, 10 CR and 10 PR. The median number of cycles for each treatment was 1 cycle (range 1-3). Median age of our population was 65 (range 58-81), the Rai stage distribution was as follows: St 0 1 pt, St I 7 pts, St II 7 pts, St III 1 pt, St IV 5 pts. The median follow-up is 14 months (range 1 to 36 months), with a median Progression Free Survival (PFS) of 14.2 months (95% Confidence Interval: 6.23-22.24). A high rate of OR (20/21) was observed with high rate of prolonged and stable responses. Prolonged neutropenia was the most relevant haematological side effect. However, infectious complication rate was acceptable. We conclude that R-FC-R is a safe and efficacious therapy in refractory B-CLL.

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WHAT'S THE ROLE OF FDG-PET/CT SCAN AT DIAGNOSIS OF NON HODGKIN LYMPHOMAS?

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Background. Correct staging is important in lymphoma patients and FDG-PET/CT is an important tool in the evaluation of lymphomas. Many authors have shown the importance of FDG-PET/CT analysis at diagnosis of lymphomas and the differences according to histologic subtypes. **Aims.** The IIL (Italian Lymphoma Intergroup) evaluated:1) the role of FDG-PET/CT versus CT scanning in the staging

of NHL, 2) the significance of FDG-PET/CT according to histologic subtypes, 3) the ability of FDG-PET/CT in showing extranodal localizations. *Methods.* We have retrospectively analysed at diagnosis 108 patients (pts) (54 male, 54 female) with FDG-PET/CT and CT. The histologic subtypes were: diffuse, large B-cell lymphoma (LBCL) 50 pts (46%), follicular lymphoma (FL) 37 pts (34%), marginal zone lymphoma (MZL) 7 pts (6%), mantle cell lymphoma (MCL) 4 pts (4%), Burkitt and Burkitt-like lymphoma (BL) 4 pts (4%), primitive mediastinal B-cell lymphoma 2 pts (2%), other lymphomas (small lymphocytic, peripheral T-cell, extranodal) 4 pts (4%). *Results.* We have evaluated nodal (18) and extranodal (12) stations. The agreement between FDG-PET/CT and CT scanning was 89% in nodal stations and 95% in extranodal, while discordance was 9% (7% toward PET/CT and 2% toward CT), and 5% (4% toward PET/CT and 1% toward CT) respectively. The percentage was sim-

ilar in the different histologic subtypes. The extranodal stations in which there were more discordances were spleen (7 pts), liver (6 pts), and bones (17 pts). FDG-PET/CT upstaged 27/108 pts (25%) and for 16% of pts the upstaging modified therapy (0 → III-IV in 4 pts (4%), I → III-IV in 3 pts (3%), II → III-IV in 10 pts (9%). The FDG-PET/CT downstaged only 9/108 pts (8%): II → I in 1 pts (1%), III-IV → II in 5 pts (4%), I → 0 3 pts (3%).

Conclusions. FDG-PET/CT and CT scanning are concordant for nodal and extranodal localizations in staging NHL. FDG-PET/CT shows more nodal (7%) and extranodal localizations (4%) than CT. There isn't substantial difference in concordance between FDG-PET/CT and CT according to the various histologic subtypes. It's important to have FDG-PET/CT baseline for early and late evaluation during and after therapy. FDG-PET/CT is essential for staging lymphomas also as exclusive method.