($P < 0.001$). Direct DNA sequencing of *C. psittaci* was performed in 10 OAL cases with *C. psittaci* infection, and 6 different sequences of *C. psittaci* were identified. However, infection rates of *C. trachomatis* and *C. pneumoniae* were very low in both OAL and NNOAD: *C. trachomatis* was not observed in any cases, and *C. pneumoniae* was found in 9% of OAL cases and in 4.7% of NNOAD cases ($P = 0.492$).
Conclusion: In this study, we observed high infection rate of *C. psittaci* in OAL cases. The results may suggest *C. psittaci* may play a role as a causative antigen to stimuli the development of OAL.

Poster presentations (Wed, 2 Nov)
Haematological malignancies

983 POSTER

Prevalence, incidence, risk factors and other anemia patterns in multiple myeloma patients: results from European Cancer Anaemia Survey (ECAS)

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Background: Although anemia is a common complication of multiple myeloma (MM) patients (pts), information on the evolution of anemia during follow up, relation with age and performance status, risk factors for its development and treatment practices was not available.
Methods: ECAS is a large, prospective, epidemiologic survey which enrolled 720 pts with MM of 15,370 pts with cancer at any stage of their disease. Survey data were collected for up to 6 data points or 6 months of scheduled visits. [1] Logistic regression modeling was applied to identify risk factors for anemia in ECAS lymphoma (L) and MM pts who were not anemic at enrollment ($n = 469$) and started on and receiving at least 2 chemotherapy (CT) cycles. [2]
Results: 28% of the 720 pts with MM were <60 years (yrs), 32% were 60 to 69 yrs and 40% were 70+ yrs old. Demographics included: 52% male, mean age of 65.7 yrs, and a mean Hemoglobin (Hb) level of 11.0 g/dL. Half of MM pts were on CT and 44% had a WHO score of 2–4. Data analysis showed 69% of MM pts were anemic (Hb <12 g/dL) at enrollment, with 30% Hb < 10 g/dL and 39% Hb of 10 to 12 g/dL. 85% were anemic at some time during the survey; 78% of those <60 yrs, 85% of those 60–69 yrs and 90% of those 70+ were ever anemic. Adverse WHO score correlated with low hemoglobin ($r = -0.346$). Despite the 59% of those who became anemic having a nadir Hb < 10 g/dL, 53% received no anemia treatment, 3% received iron, 21% transfusion and 24% received epoetin. 75% of CT pts became anemic during ECAS, 60% of those <60 yrs, 88% of those 60–69 yrs and 100% of those 70+ yrs. Logistic regression analysis of L/MM pts revealed 4 variables significantly predicting anemia development. They were assigned score values based on the respective adjusted odds ratios: Initial Hb (adjusted odds ratio (AOR) 4.2), persistent/recurrent disease (AOR 2.8), female gender (AOR 1.5), and treatment with platinum-based chemotherapy (AOR 5.5) were found to independently predict anemia ($P < 0.001$), with an area under the receiver operating characteristic (ROC) curve of 0.821 (95%-CI; 0.763–0.878), indicting acceptable predictive accuracy of the model. To help better identify the L/MM patients most likely to develop anemia, three levels of risk (low [24%], moderate [51%], and high [72%]) were calculated from the model scores ($\chi^2_{(2)} = 112.6$; $P < 0.001$). [2]
Conclusions: Prevalence of anemia was high (69.2%), increased with age, correlated with poor WHO score; anemia was found in 85.3% of pts at least once during the 6 months survey. The identification of predictors of anemia allows early intervention with appropriate anemia treatment in order to optimize overall patient care.

References

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984 POSTER

Novel anti-cancer compounds – jasmonates, kill leukemic cells from chronic lymphocytic leukemia patients: selectivity and mechanism of action

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Background: Jasmonates have recently been shown by us to be a novel class of anti-cancer agents in vitro and in vivo. We found that jasmonates killed various types of cancer cells while sparing normal lymphocytes. Many chemotherapeutic drugs induce mitochondrial membrane permeability transition, membrane depolarization, osmotic swelling, and release of cytochrome C, involving the opening of the mitochondrial permeability transition pore complex (PTPC), and resulting in cell death. Since jasmonates exert their cytotoxic effects independent of transcription, translation and p53 expression, we hypothesized that these compounds act directly on mitochondria, and that this may be the basis for their selective activity against cancer cells.
Methods: Blood cells were purified by density gradient centrifugation. Three-color FACS analysis determined the percentage of leukemic cells in blood samples from chronic lymphocytic leukemia (CLL) patients. Mitochondrial membrane depolarization was determined by flow cytometry, and cytochrome C release by Western blotting analysis. Mitochondria were isolated by mechanical lysis and differential centrifugation. Cytotoxicity was measured by a tetrazolium-based assay, and mitochondrial swelling by spectrophotometry.
Results: A correlation was found between the ex-vivo cytotoxicity of methyl jasmonate (MJ), and the percentage of leukemic cells in the blood sample of the respective CLL patient. Moreover, exposure of blood cells from CLL patients to MJ caused the preferential death of the leukemic cells (CD5+/CD19+). MJ and additional jasmonates induced membrane depolarization in CLL cells. In addition, jasmonates induced swelling and release of cytochrome C in mitochondria isolated from CLL cells, but not in mitochondria isolated from 3T3 non-transformed cells or from normal lymphocytes, in a manner dependent on PTPC opening.
Conclusions: Jasmonates act directly on mitochondria derived from CLL cells in a PTPC-mediated manner, and could therefore bypass pre-mitochondrial apoptotic blocks. Also, jasmonates are endowed with the unique capability to selectively damage mitochondria from transformed cells (reflecting probably specific characteristics of mitochondria in cancer cells), resulting in preferential killing of cancer cells. Thus, we predict that jasmonates might be devoid of side-effects; and propose that they are promising candidates for the treatment of CLL and other types of cancer.

985 POSTER

Naturally occurring tyrosine kinase inhibitor, genistein, exerts distinct anti-leukemia mechanisms in AML and APL cells

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Background: Acute myeloid leukemia (AML) in general, has a poor long term outcome even after intensive debilitating chemotherapy. Novel and less toxic therapy are urgently needed. Genistein, an isoflavone which is a naturally occurring tyrosine kinase inhibitor present in soybeans has been shown to be an active agent in APL (NB4) harboring PML-RAR fusion gene in our previous study (Khan et al. Blood 104: 692a, 04). We extend our study to test genistein in other AML cell lines with different doses and time points with the aim to elucidate biological pathways affected by genistein in APL and AML cells using DNA microarrays.
Material and methods: Leukemia cells were cultured in RPMI 1640+10% FBS. Cell growth and apoptosis were measured and compared with untreated group. Gene expression analysis was carried out with Affymetrix human genome HU133Av2 chip. Data analysis was done using R and GeneSpring softwares.
Results: Genistein inhibited NB4, HL-60, K562, KG-1 and NOMO-1 growth (IC50 20–30 μM) equally well in dose and time dependent fashion from 20 to 50 μM in 24, 48 and 72 hours. Flow cytometry showed treated cells were blocked at G2/M followed by apoptosis. Two cell lines, HL60 and NB4, representing AML and APL were chosen for DNA microarray studies. Interestingly, gene expression profiles in HL60 varied greatly from NB4 cells. 684 and 364 genes were differentially regulated by more than 2-fold in HL60 and NB4, respectively. However, only 26 genes of these are in common. Although MAPK signaling and apoptosis pathways are among the most affected pathways by genistein treatment, the patterns differ significantly between HL60 and NB4 cells. In HL60, FGFR1 and Ras were activated, leading to the activation of transcription factors Jun and FOS, resulting in predominant signaling for differentiation. In NB4, TGFβ,