Poster session I
Epidemiology

167 RACIAL/ETHNIC PATTERNS OF NK/T CELL LYMPHOMA IN CALIFORNIA: A POPULATION-BASED STUDY

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Background: Natural killer (NK)/T cell lymphoma is rare in western countries, but is more common in Asia and Central and South America. Little is known about whether the clinical behavior of this disease varies by race/ethnicity within geographic regions. Herein, we analyzed the characteristics of NK/T cell lymphoma among different ethnic groups in California.

Patients and Methods: A total of 213 non-Hispanic Whites, Hispanics and Asians/Pacific Islanders (APIs) diagnosed with NK/T cell lymphoma were identified in California Cancer Registry from 2001 to 2008. Eight of these patients were HIV positive. SEER*Stat software was used for age-adjusted incidence rates and Joinpoint Regression software was used to calculate the annual percent change (APC). Overall survival (OS) was determined by the Kaplan-Meier method and the Cox proportional hazards regression.

Results: The incidence rates of NK/T cell lymphoma in Whites, Hispanics and APIs were 0.05, 0.18 and 0.22 per 100,000 person-years, respectively, among males; and 0.03, 0.07 and 0.10 per 100,000 person-years, respectively, among females. The incidence rate increased from 2001 through 2008, most prominently in Hispanic males, by 27.6% per year (95% confidence interval [CI]: 13.2%, 43.8%). Whites were slightly older at diagnosis (median: 56 years) than Hispanics and APIs (42 and 48 years, respectively). The distributions of local/regional vs. distant disease at presentation in Whites, Hispanics and APIs were 58% vs. 42%, 70% vs. 30%, and 70% vs. 26%, respectively. Clinical outcomes were poor in all groups, with 5-year OS of 30.4%, 28.6%, and 24.0% in Whites, Hispanics and APIs, respectively. Patients with HIV infection appeared to have similar outcomes to those who were HIV negative, although the number of HIV patients was small. In a multivariate analysis, distant vs. local/regional disease and initial treatment with chemotherapy plus radiotherapy, or radiotherapy alone vs. neither treatment were associated with OS, with hazard ratios of 2.0 (95% CI: 1.4, 3.0), 0.39 (95% Cl: 0.22, 0.70) and 0.47 (95% Cl: 0.23, 0.98), respectively. OS was not affected by age, sex, race/ethnicity, chemotherapy alone, neighborhood socioeconomic status, or HIV infection.

Conclusions: NK/T cell lymphoma is more common among Hispanics and APIs than Whites in California, with increasing incident among Hispanic males. The clinical characteristics of this disease are more similar between Hispanics and APIs than Whites, but OS is similarly poor in all three groups.

168 INVERSE ASSOCIATION BETWEEN SOY INTAKE AND NON-HODGKIN LYMPHOMA RISK: A CASE-CONTROL STUDY IN JAPAN

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Introduction/background: The reason for the worldwide increase in the incidence of non-Hodgkin lymphoma (NHL) over the last several decades remains unclear. Environmental factors, such as diet have an important association with the risk of cancer. Soy intake is much higher among Asians than Westerners. This bean contains significant amounts of isoflavones, which may play a role similar to phytoestrogens that bind competitively to estrogen receptors but have a weak estrogenic effect of nearly 0.1% of that of estradiol. Although soy intake has been associated with a reduced risk of several cancers such as breast, prostate, colorectal, and gastric cancer, its association with NHL is not known.

Patients and Methods: We evaluated the association between soy intake and risk of NHL by conducting a hospital-based case-control study in 302 patients with NHL and 1510 age- and sex-matched control subjects. In accordance with our *a priori* hypothesis that the effect of soy on NHL risk may differ by sex, sex-stratified analysis for evaluation of effect modification was defined as the default model. Analysis after stratification by reproductive factors was also performed. We also evaluated the impact of soy on the three histological subtypes, namely DLBCL, FL, and MZBCL. Odds ratio and 95% confidence intervals for groups with moderate (27-51 g/day) to high (> 51 g/day) relative to low (< 27 g/day) intake were calculated using a multivariate conditional logistic regression model. Alcohol status, smoking status and early adulthood weight were adjusted in the analysis as confounders.

Results: Soy intake was significantly associated with a reduced risk of NHL in women but not in men (Table). This finding appeared consistent across NHL histological subtypes. No reproductive factors including age of menarche, menopausal status, parity and age of first delivery were found to interact with soy intake.

Conclusion: These results indicate the potential importance of certain ingredients in soy for lymphomagenesis. Further studies to evaluate the mechanism behind the association between soy intake and lymphomagenesis are warranted.

Table. Odds ratio for the risk of non-Hodgkin lymphoma with soy intake

	Male			Female			p-heterogeneity by sex
	case/ control	OR	95% CI	case/ control	OR	95% CI	
Soy intake (g/day)							0.02
Low (<27)	43/267	1.00	(Reference)	60/221	1.00	(Reference)	
Moderate (27-51)	50/221	1.41	(0.88-2.25)	47/271	0.62	(0.40-0.95)	
High (>51)	49/225	1.35	(0.84-2.17)	46/271	0.61	(0.39-0.96)	

169 THE RELATIVE FREQUENCIES OF LYMPHOMA SUBTYPES IN CHINA: A NATIONWIDE STUDY OF 10002 CASES BY THE CHINESE LYMPHOMA STUDY GROUP

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Background: In China, domestic epidemiologic data about lymphoma is lacking so far. A nationwide collaborative study has been recently carried out by the Chinese Lymphoma Study Group to throw light on this issue.

Materials and methods: 10002 lymphoma cases diagnosed in 2010 at 24 representative medical centers were collected and analyzed. The cases contributed by each institute were all consecutive ones, diagnosed according to the updated WHO classification, and randomly sampled and reviewed by a panel of 5 expert hematopathologists to ensure the diagnostic accuracy.

Results: The patients comprised 6188 males and 3814 females (M to F ratio 1.6:1), with a median age of 54 yrs (range 1-95, average 50.4). Extranodal lesions were slightly more common than nodal ones (N to E ratio 1:1.2). The distribution and relative frequencies of each lymphoma subtypes were listed in Table 1.

Conclusions: DLBCL, NOS is the commonest subtype (37.9% of NHLs and 33.3% of all lymphomas) in the Chinese population, whereas FL is less common than in Western countries. Extranodal lesions and T/NK-NHLs (eg, extranodal NK/T-cell lymphoma) appear more common in China. HL comprises less than 10% of all lymphomas and the most common subtypes are MC and NS.

Table. 1 [number of case (percentage)]

	B-LBLL 172 (2.6)				
B-NHLs 6632 (66.3)	DLBCL, NOS 3328 (50.2)	DLBCL, special subtypes 248 (3.7)	MALTL 685 (10.3)	FL 551 (8.3)	CLL/SLL 424 (6.4)
	MCL 307 (4.6)	Plasmacytoma 221 (3.3)	BL 107 (1.6)	NMZL 99 (1.5)	LPL 57 (0.9)
	SMZL 41 (0.6)	HCL 5 (0)	UC 387 (5.8)		
T/NK-NHLs 2138 (21.4)	T-LBLL 296 (13.8)				
	NK/T-cell lymphoma 602 (28.2)	PTCL, NOS 425 (19.9)	AITL 266 (12.4)	ALCL, ALK+ 157 (7.3)	ALCL, ALK- 90 (4.2)
	SPTCL 25 (1.2)	MF/SS 21 (1.0)	EATCL 20 (0.9)	Cutaneous CD30+ T-LPDs 18 (0.8)	ATLL 13 (0.6)
	HSTCL 10 (0.5)	Cutaneous PTCL, rare subtypes 15 (0.7)	UC 180 (8.4)		
HL 854 (8.5)	NLPHL 55 (6.4)				
	MCCHL 356 (41.7)	NSCHL 338 (39.6)	LRCHL 67 (7.8)	LDCHL 13 (1.5)	UC 25 (2.9)
Lymphoma, UC 378 (3.8)					

UC, unclassifiable due to certain reasons such as insufficient materials or ancillary studies

170 EXPOSURE TO ANIMALS AND RISK OF OCULAR ADNEXAL MARGINAL ZONE B-CELL LYMPHOMA

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Background: *Chlamydophila psittaci* (Cp) has been associated, with variable geographic patterns, with ocular adnexal marginal zone B-cell lymphoma (OAMZL). Cp is the etiological agent of psittacosis in humans, a zoonotic disease caused by exposure to infected animals, mostly birds but also domestic mammals and pets. We have therefore investigated the potential association between professional and/or domestic exposures to animals and the occurrence of OAMZL.

Patients and Methods: A hospital based case-control study was conducted at the San Raffaele Sc. Inst., Milan, Northern Italy, between 2004 and 2009. Forty-eight consecutive patients (pts) with a histologically confirmed diagnosis of OAMZL (median age: 60 years; 71% females) were enrolled; controls were 87 consecutive pts (median age: 65 years; 51% females) with a histologically confirmed diagnosis of nodal non-Hodgkin lymphoma (46% DLBCL, 36.8% follicular, 8% small lymphocytic, 2.3% mantle cell, 2.3% Burkitt, 2.3% anaplastic Ki-1+, and 2.3% unclassified). A standardized and validated questionnaire was used to investigate occupational and domestic exposure to animals. Age- and sex-adjusted multiple logistic regression (MLR) odds ratios (OR) and 95% confidence intervals (CI) were used to estimate the association between the above mentioned exposures and the occurrence of OAMZL.

Results: Overall, 38 of 48 cases of OAMZL (79.2%) reported an exposure (lifetime) to one or more household animals (22 pts were exposed to cats, 23 to dogs, and 20 cases to birds). Among the 87 controls, 56 (64.4%) pts reported an exposure (lifetime) to one or more domestic animals (33 patients to cats, 25 to dogs, and 26 cases to birds). The corresponding MLR-OR associated with the occurrence of OAMZL for exposure to household animals was 2.16 (95% CI: 0.93 - 5.03). With regard to occupational exposure to animals, 17 (35.5%) OAMZL pts and 6 (6.9%) control pts were employed in breeding and/or slaughtering of animals, with a corresponding MLR-OR of 8.75 (95% CI: 2.96 - 25.81).

Conclusions: This case-control study indicates that, compared to other lymphoma histotypes, the risk of OAMZL is markedly increased by exposure to household animals and, consequently, to Cp. In particular, occupational exposure to animals appears a strong determining factor for OAMZL. These results stimulate further studies aimed at identifying the etiologic agents related to this exposure and involved in OAMZL pathogenesis.

170 BIS - DISTRIBUTION OF LYMPHOMA SUBTYPES IN SUB-SAHARAN AFRICA

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Background: Lymphomas are a heterogeneous group of lymphoid malignancies and over 60 types of lymphomas are currently recognized. The distribution of various lymphoma subtypes varies significantly across the world and study of this variation provides us critical tools to understand lymphomagenesis. Burkitt lymphoma which was discovered in sub-Saharan Africa has contributed immensely to our understanding. Despite such contribution, due to the unavailability of the requisite infrastructure for classifying lymphomas, the precise distribution of different lymphomas in sub-Saharan Africa is still unclear.

Material & Methods: A team of five haematopathologists visited six sub-Saharan African centres and undertook a review of 159 fine needle aspirate (FNA) and 467 histological samples. These were consecutively accrued samples, and age, sex and site of biopsy were documented. The histological samples were further analyzed by immunohistochemistry in European institutions and the cases were further re-evaluated by the experts and a consensus diagnosis was made as per the 2008 WHO classification. The distribution of lymphomas was further compared with those from the rest of the world.

Results: Among the 159 FNA samples, 76% were confirmed to be Burkitt lymphoma (BL) and in an additional 12%, a diagnosis of lymphoma other than BL was suggested. Among the 467 histological samples, male patients accounted for 57% and children <18 years of age accounted for 41%. Among the histological samples, a consensus diagnosis was possible in 393 samples, of which 312 were non Hodgkin lymphoma (NHL) and 52 were Hodgkin lymphoma. Among NHLs, BL, diffuse large B-cell lymphoma (DLBCL) and small lymphocytic lymphoma (SLL) accounted for 41%, 35% and 6% respectively. However, among adults (>18 years), BL accounted for only 9% of NHL and DLBCL accounted for 55%. Nearly all the major lymphoma types seen in the West were encountered in sub-Saharan Africa.

Conclusion: The distribution of lymphoma subtypes differs significantly from the rest of the world. Our study provides the first detailed analysis of the distribution of various lymphoma subtypes among a large cohort of lymphomas from sub-Saharan Africa.

171 EPSTEIN-BARR VIRUS-POSITIVE DIFFUSE LARGE B-CELL LYMPHOMA OF THE ELDERLY IS RARE IN CHINESE POPULATION

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Introduction: Epstein-Barr virus (EBV)-positive diffuse large B-cell lymphoma (DLBCL) of the elderly is a lymphoproliferative disorder recently included as a "provisional" entity in the 2008 WHO Classification of Tumors of Hematopoietic and Lymphoid Tissues. It is defined as an EBV-positive DLBCL of patients older than 50 years, without any known underlying immunosuppression. Most studies that led to the introduction of this entity were derived from South Korea and Japan with reported incidences range from 7.5% to 11.4%.The studies showed the incidences in Western population are much lower and range from 3.1% to 5%. Herein, we reported the frequency of EBV-positive DLBCL of the elderly in a representative Chinese population.

Patients and Methods: Two-hundred-sixty-six cases of primary DLBCL were selected from the files of the Tianjin Medical University Cancer Hospital, Tianjin, China. All patients with a known underlying immunosuppressive condition such as HIV infection, prior transplantation, known or coincidental lymphoproliferations other than the DLBCL were excluded. Paraffin blocks were selected and tissue microarrays (TMA) were constructed. Immunohistochemistry (IHC) stains for CD20, CD3, CD10, BCL6 and MUM1 in addition to the in situ hybridization for EBV encoded RNA (EBER) were performed.

Results: Of the 266 patients, 146 were male and 120 female. The mean age was 57.3 years (range: 16 – 91 years). 192 patients (72.2%) were older than 50 years. Using Hans' algorism, these cases were subclassified based on the IHC profiles and included 63 (63/254, 24.8%) germinal center B-cell-like (GCB) DLBCL and 191 (191/254, 75.2%) non-germinal center B-cell (non-GCB) DLBCL. EBER was evaluable in 208 cases, and 11 (5.3%) were positive. EBER was expressed in a range from 30% to 100% in tumor cells. All cases of the EBV-positive cohort had a non-GCB-DLBCL immunophenotype and were often negative for CD10 and BCL6.Compared to EBV-negative cohort (median age 58 years, ranged from 16-91 years), the patients in the EBV-positive cohort were older with median age at 70 years (ranged from 43-85 years) (p=0.031). Nine of the 11 cases were older than 50 years and fulfilled the WHO criteria of EBV-positive DLBCL of the elderly (9/208; 4.3%).

Conclusions: EBV-positive DLBCL of the elderly is not as common in Chinese population as reported in other East Asian countries. Patients with EBV-DLBCL tend to have a non-GCB-DLBCL phenotype.

171 BIS -ANAPLASTIC LARGE CELL LYMPHOMA AND BREAST IMPLANTS: RESULTS FROM A STRUCTURED EXPERT CONSULTATION PROCESS

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Introduction/Background: There are growing concerns about a possible association between anaplastic large cell lymphoma (ALCL) and breast implants. We conducted an evidence review and a structured expert consultation process on ALCL and breast implants.

Materials/Methods: Experts were recruited to participate in an expert consultation process based on the RAND/UCLA Appropriateness Method. After a systematic literature review and development of 65 statements related to ALCL and breast implants, panelists independently rated their level of agreement with each item. Following a face-to-face meeting to discuss ratings, panelists independently re-rated the statements. Data for the final ratings were synthesized and analyzed.

Results: Panelists agreed that (1) there is a positive association between breast implants and ALCL development but likely under-recognition of the true number of cases; (2) a recurrent, clinically evident seroma occurring ≥ 6 months after breast implantation should be aspirated and sent for cytologic analysis; (3) anaplastic lymphoma kinase (ALK)-negative ALCL that develops around breast implants is a clinically indolent disease with a favorable prognosis that is distinct from systemic ALK-negative ALCL; (4) management should consist of removal of the involved implant and capsule, which is likely to prevent recurrence, and evaluation for other sites of disease; and (5) adjuvant radiation or chemotherapy should not be offered to women with capsule-confined disease. Little agreement, however, was found regarding etiologic risk factors for implant-associated ALCL.

Conclusions: Our assessment yielded consistent results on a number of key issues regarding ALCL in women with breast implants, but substantial further research is needed to improve our understanding of the epidemiology, clinical aspects, and biology of this disease.