Session 1: lymphoma epidemiology

008 PRIMARY CENTRAL NERVOUS SYSTEM LYMPHOMA (PCNSL) CONTINUES TO INCREASE AMONG OLDER (≥ 65 YEARS OF AGE) PATIENTS IN THE UNITED STATES (US) BUT NOT AMONG YOUNGER (20-64 YEARS OF AGE) PATIENTS. A SURVEILLANCE, EPIDEMIOLOGY AND END RESULTS (SEER) STUDY

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Introduction: Up to now PCNSL incidence in the US was presumed to be increasing in all age groups independent of changes in nosology, new diagnostic techniques, and HIV infection. The intent of our study was to extend our prior study of PCNSL incidence in the US (Olson *et al*, Cancer 2002;95:1504-10) with an additional decade of SEER data with a particular focus on incidence trends in age groups.

Methods: PCNSL age-adjusted incidence rates from 1973-2007 were obtained from the nine SEER registries used in the Olson *et al.* study. The same exclusion criteria were used to remove PCNSL most likely associated with HIV (never married males and females; persons of unknown marital status; all cases reported in the San Francisco registry). To assess the effect of additional geographic regions in the US age-adjusted incidence rates were determined for all thirteen registries in current use. To assess the accuracy of the criteria in removing HIV associated cases, incidence rates of Kaposi sarcoma (KS) were assessed with and without the use of the same exclusion criteria. Age-adjusted Incidence by latitude was calculated for all cases.

Results: The incidence of PCNSL in the general population continues to increase in the nine registry cohort and the thirteen registry cohort. Stratifying the incidence rate by age group and employing the exclusion criteria, PCNSL incidence has remained stable in the 20-64 year old population, but has steadily increased in the 65+ population. Removing the exclusion criteria did not alter the data for the 65+ population but demonstrated a sharp drop in incidence after 1996 for the 20-64 year old population. Applying the same HIV exclusion criteria the incidence of KS resulted in no appreciable change in incidence rates over the same time frame. No difference was observed for the latitude at which the patient resided at diagnosis.

Conclusion: The incidence rate of PCNSL is increasing. This increase is driven by a continued increase in incidence among the 65+ population while the incidence for those aged 20-64 has stabilized during the same time frame. An effect of HAART on PCNSL incidence in the US is suggested by the decline in the incidence among the 20-64 year old population without the HIV exclusion criteria.

009 PREVALENCE AND FREQUENCY OF CIRCULATING T(14;18)-POSITIVE CELLS IN HEALTHY INDIVIDUALS OF A POPULATION-BASED CROSS SECTIONAL STUDY – ASSOCIATION WITH AGE AND GENDER BUT NOT WITH SMOKING STATUS

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Introduction: The t(14;18)(BCL2/IgH) translocation is the genetic hallmark of follicular lymphoma (FL). Circulating t(14;18)-positive cells can not only be detected in FL patients but also in healthy subjects without lymphoma. We used epidemiological data and blood samples of the population-based study of health in Pomerania (SHIP) to verify associations of FL risk factors and t(14;18)-positive cellsin healthy individuals.

Material and Methods: We tested buffy coat-DNA samples from 4152 study participants (median age 50 years, range 20-81 years, 2100 women) by real-time PCR for the presence and frequency of t(14;18)-positive cells.

Results: t(14;18)-PCR results were evaluable from 3966 subjects, 1526 subjects were tested positive (38.5%, median number of t(14;18)-positive cells in positive subjects 3.9 per million nucleated cells (NC), range 0.6 – 9299 per million NC). t(14;18)-prevalence was lowest in the age group 20-29 years (24.1%) and highest in the age group 50-59 years (47.2%) and higher in men than in women (43.3% vs. 33.7%, P< 0.0001). In multivariate analyses age and gender were significantly associated with t(14;18)-prevalence (logistic regression model, $p \leq 0.001$) but not with different parameters of smoking exposure (smoking status, pack years either in groups or as a continuous variable). In multivariate analyses t(14;18)-frequency was positively associated with age but not with gender or variables of smoking exposure.

Conclusion: This large study of t(14;18) in subjects without lymphoma enabled for the first time multivariate analyses of different known FL risk factors. We report that higher age was significantly associated with a higher t(14;18)-prevalence and t(14;18)-frequency whereas smoking had no clear effect on both variables. Male gender was associated with a higher t(14;18)-prevalence but not with a significantly different t(14;18)-frequency.

010 A COMPREHENSIVE ANALYSIS OF THE UNITED STATES (US) HODGKIN LYMPHOMA (HL) SEER DATABASE: THE IMPACT OF RACE AND PLACE OF BIRTH ON INCIDENCE AND SURVIVAL

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Background: Racial disparities in incidence, as well as survival, have been documented in a number of malignancies, including non-Hodgkin lymphoma. However, there remains a paucity of data on ethnic disparities in adult HL.

Methods: We examined the age-specific incidence and mortality rates for US adult HL according to race as well as age, gender, and histology using the US Surveillance, Epidemiology, and End Results (SEER) 13 registries database. Further, we examined incidence patterns across different decades as well as US vs foreign-born trends. All statistical analyses were performed in SEER*Stat.

Results: A total of 16,783 HL cases were diagnosed among residents in the 13 SEER registry areas from 1992 through 2007. Whites contributed the largest number (n=11,890), followed by Hispanics (n=2,232), Blacks (n=1,701), and Asian/Pacific Islanders (A/PI) (n=775). Whites show a continued bimodal incidence curve (ages 20-29: $6.0/1x10^6$, ages 50-59: $2.6/1x10^6$, ages 70-79: $4.2/1x10^6$), while Blacks have a much less clear pattern (ages 20-29: $4.2/1x10^6$, ages 50-59: $2.8/1x10^6$, and ages 70-79: $3.0/1x10^6$). A/PI's also exhibited a bimodal age-related incidence pattern (ages 20-29: $2.1/1x10^6$, ages 50-59: $0.9/1x10^6$, and ages 70-79: $2.0/1x10^6$), while Hispanics are distinctly not bimodal with a small increase at ages 20-29 ($2.3/1x10^6$) followed by an exponential-like increase with peak incidence at ages 70-79 ($5.1/1x10^6$). Furthermore, HL is significantly more common > age 65 in Hispanics compared with Whites ($5.1\text{-}7.0/1x10^6$ vs $3.9\text{-}4.5/1x10^6$, respectively, $p<0.05$). Considering gender, HL was more common in males compared with females within all races except A/PI. This male excess, however, does not occur until ages 40-49 in all races, except A/PI. In terms of birthplace, we found that US-born A/PI and US-born Hispanic groups ages 20-39 have a significantly higher incidence of HL compared with their foreign-born counterparts ($p<0.05$), while the incidence converges for US- and foreign-born individuals > age 40. Interestingly, during the 16-year period studied, A/PI incidence rates for individuals ages 20-29 increased > 100% (1992-1997: $1.5/1x10^6$, 2003-2007: $3.2/1x10^6$, $p<0.05$), while all other races and age groups had stable incidence rates. Furthermore, we found that this rapid increase in HL incidence for A/PI (ages 20-29) was restricted to US-born A/PI. Age-specific HL ethnic disparities in mortality were also apparent. Among HL ages 60-79, Hispanics had a significantly higher mortality rate compared with Whites and Blacks ($p<0.05$), while among younger patients (ages 20-59), Hispanics conversely had a lower mortality rate compared with Whites and Blacks. Additionally, at all ages, A/PI had the lowest mortality of any race/ethnic group.

Conclusions: Multiple important ethnic disparities, including survival, are evident across races in US adult HL. Moreover, the predictive potential of US and foreign birth incidences point to the potential importance of environmental and lifestyle factors.