Epidemiology of Paediatric Acute Lymphoid Leukemia in Latvia in 1988–2015

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Introduction. Acute lymphoid leukemia (ALL) is the most common paediatric malignancy with male predisposition and peak at the age 2–5. 35–40 primary cases per million children are reported in the USA and Nordic countries, 30–35 in Eastern Europe. Highest rate in the US is among Filipinos and Hispanics, while in Afro-Americans it is 3-fold lower. Some data demonstrate a growth of ALL incidence (Pui, 2012). Epidemiology of childhood ALL in Latvia is of interest because of two large separated ethnic groups (Latvians and others who are mainly of Slavic origin), low internal migration and immigration (Eurostat, 2014).

Aim, Material and Methods. The aim of the study was to retrospectively study paediatric ALL epidemiology in Latvia. Registry of the Hematooncological Department was accessed for patients' diagnosis year, gender, age, nationality (by self-assessment and language preference). Demographic data were obtained from Central Bureau of Statistics (database "Population and Social Processes", including total yearly population, extrapolated yearly children (0–14), total by cities/countryside, extrapolated children by regions). MS Excel and IBM SPSS v.21. were used for data analysis (Mann-Whitney U test for differences).

Results. 332 consecutive primary paediatric ALL patients (age 0–14) diagnosed during the 1988–2015 period were included; median 11.5 cases per year, no significant difference was found between 1988–2000 and 2001–2015 periods. Incidence for the whole period was 28.4 per million children (0–14); it has significantly increased from 24.7 in 1988–2000 to 33.1 in 2001–2015 ($p = 0.018$). There was a slight male prevalence (M : F = 1.2), median age was 4; both parameters did not change with time. Age group 2–6 was the most affected (62% patients). 209 patients were defined as ethnic Latvians, 123 of other nationalities. Paediatric ALL incidence in total Latvian population was significantly higher (5.9 per million vs. 4.1 in non-Latvians, $p = 0.033$). M : F ratio was lower in Latvian patients (1.13 vs. 1.34, difference non-significant). Patients' age structure was analogous in both ethnic groups. City or region of residence at the time of diagnosis was analysed for 268 patients diagnosed before 2010; overall, ALL incidence for the period was 28.7 per million children (0–14). There were regional differences: the incidence was 30.5 in Kurzeme, 30.4 in Vidzeme, 29.4 in Riga region, 28.8 in Riga city, 23.5 in Zemgale and 21.8 in Latgale. The difference was statistically significant both for Latgale vs. the rest of the country ($p = 0.031$) and for Latgale with Zemgale vs. the rest of the country ($p = 0.039$). The incidence of paediatric ALL varied between cities (4.2 per million total population) and countryside (6.8 per million) during the 1988–2009 period, the difference was significant ($p = 0.030$).

Conclusions. The incidence of paediatric ALL in Latvia is nearer to Eastern European level, but there is a statistically significant increasing trend. Gender and age structure of the patient cohort is similar to the developed countries. Differences in paediatric ALL incidence between Latvians and non-Latvians, though statistically proven, should be checked by age-standardised approach, since indirect data (like unequal birth rate) point at possibly different age structure of the ethnic groups. Variable geographic distribution of paediatric ALL may be related to the above mentioned ethnic factor, or unknown environmental factors may be responsible. A more detailed further study seems to be indicated.