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Incidence of systemic lupus erythematosus in Finland, 2000–2007, a nationwide study

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ABSTRACT

Objective. *To determine the age- and sex-specific incidence rates of systemic lupus erythematosus (SLE) in Finland.*

Methods. *The incident cases were identified through diagnostic register searches for SLE on the nationwide database of the Social Insurance Institution.*

Results. *During the 8-year study period 599 incident cases occurred (518 females, 81 males). The mean annual incidence rate of SLE for adults was 1.69 per 100, 000 (95% CI 1.56–1.84) and was highest among females aged 40-59 years. The gender incidence rate ratio was 6.43 (95% CI 5.06–8.26). The incidence for children was 0.39 (95% CI 0.27-0.55).*

Conclusion. *The incidence of SLE was lower compared to the countries at the same latitudes. SLE in children remained a rarity.*

Introduction

Systemic lupus erythematosus (SLE) is a rare autoimmune disorder with heterogeneous, multi-organ involvement and individual disease course. A patient is considered to have definite SLE if 4/11 American College of Rheumatology (ACR, revised 1997) criteria are fulfilled (1). These things result in difficulties to reach patients with an early disease. The ACR97 criteria may also miss patients with a mild disease. In fact, the classification criteria were validated for established SLE rather than incident SLE (2).

Worldwide incidence of SLE varies greatly according to differences in gender, race, age, environment, and study methods (2, 3). The reported incidence rates range generally from 3.0 to 7.2/100,000 in the Western world (4-6) and seem to be higher in Asia ranging up to 8.1 (7). In the Scandinavian countries, studies with different designs have estimated incidence rates between 1.0 and 4.8 (8-11). The clearest risk factor for SLE is female gender. The risk is 5 to 10 times higher in women compared to men (3,6,12). Non-white populations develop worldwide SLE 2 to 4 times more frequently than Caucasians (3). In the "Euro-Lupus Project" mean age at diagnosis was 31 years for adults and for children mean age at disease onset was 11 years and at diagnosis 16 years (12).The studies on the paediatric-onset SLE have shown markedly lower incidence rates compared to the adults. In Finland the incidence in children was 0.4 (13) and around the world between 0.3 and 0.9 (8, 14).

The aim of this study was to evaluate the incidence of SLE in Finland by using nationwide data from the registry of the Social Insurance Institution (SII).

Material and methods

The search of SLE patients was based on the registry of the SII between 1 January 2000 and 31 December 2007. All permanent residents are insured by the National Health Insurance and registered into register of insurances of the SII, since babyhood when the identity code is generated. At the end of year 2007, the Finnish population was 5 300,484, including 1 028,872 children aged 0–16 years (15) and almost all residents are Caucasians. All patients with defined chronic diseases like SLE are entitled to specially reimbursed medication 72% of the costs instead of the standard 42%. For entitlement, a patient must file a medical certificate based on an examination of a specialist treating SLE and describing the diagnostic procedure and drug treatment plan according to a good medical practice. Medical specialists like nephrologists and dermatologists, as well as rheumatologist may make a certificate, which is re-evaluated and approved by a medical examiner physician of SII. Certificates are processed within one month. Medicines like hydroxychloroquine, azathioprine, glucocorticoids as well as other disease modifying antirheumatic drugs (DMARDs) are specially reimbursed. The SII maintains the register on special reimbursement decisions.

Patients with SLE were identified by the codes of M32 according to the international classification of disease-10 codes (ICD-10). The date of entitlement to SLE medication was defined as the date of diagnosis, as the common policy is to apply the special reimbursement at diagnosis. Patients under 17 years of age were categorised as children. Clinical data were not available.

Statistical methods

Descriptive values are expressed as means with standard deviations (SDs). The mean annual incidence rates were calculated by dividing the number of newly diagnosed SLE patients over an 8-year period (2000–2007) by the population at risk (from Statistics Finland). The 95% confidence intervals (95% CIs) were calculated assuming a Poisson distribution. Standardised estimates of rate ratios (IRRs) were calculated by using Poisson or negative binomial regression models when appropriate. The permission to use register data was obtained from the Finnish SII.

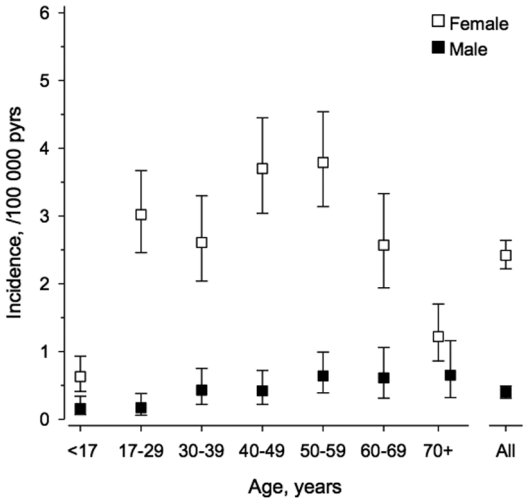
Results

A total of 566 new adult SLE cases (492 females and 74 males) were identified between the years 2000–2007. Mean age at diagnosis was 45.7±15.8 years for females and 51.8±15.2 years for males (p=0.002). The mean annual incidence rate of SLE in the adult Finnish population was 1.69 (95% CI: 1.56 to 1.84)/100,000; in females 2.85 (2.60 to 3.11) and in males 0.46 (0.36 to 0.57). The gender incidence rate ratio was 6.43 (95% CI: 5.06 to 8.26, age-adjusted).

Age-specific rates by sex are displayed in Figure 1. There was no statistical significant variation in the incidence between age groups in males (p=0.80), whereas there were clear differences in the incidence between age groups in females (p<0.001). The highest incidence rates occurred in the age groups between 40 to 59 years and a smaller peaking among individuals of 17 to 29 years of age. Figure 2 shows the number of new SLE cases according to age and gender.

SLE is rare in children. Thirty-three children developed a new disease (26 girls, 7 boys). The mean annual incidence rate of SLE in children was 0.39 (0.27 to 0.55); the respective incidences, among girls and boys were 0.63 (0.41 to 0.93) and 0.16 (0.07 to 0.34). The mean age at diagnosis in children was 13.0±3.0 years.

Fig. 1. The mean annual incidence of systemic lupus erythematosus by age and sex in Finland in 2000-2007.



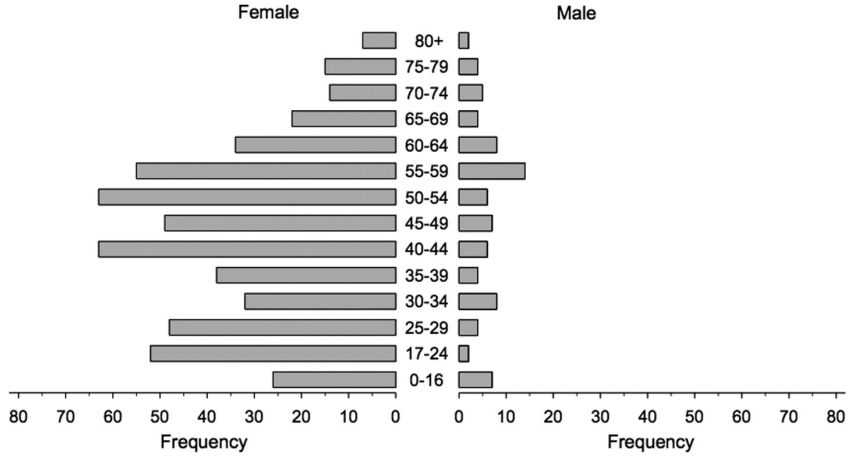


Fig. 2. Number of incident SLE cases in various age groups among females and males in Finland in 2000-2007.

Discussion

To our knowledge, this is one of the few nationwide studies on the incidence of SLE in the entire population (7, 13). Our estimation suggests that the frequency of SLE is low in Finland and close to that earlier reported in Denmark. The Danish study reported an incidence rate of 1.0/100 000 in the county that represented 9% of the entire adult population. The study used four separate and independent sources for case inclusion and the patients were supposed to have SLE if they had a multisystem disease with autoantibodies and any alternative diagnose was missing. At final the definite SLE cases were defined according to ACR criteria (10). The population-based studies in other Scandinavian countries have shown higher incidence rates, although having a similar homogenous population. The Swedish study used similar clinical case inclusion as the Danish study from diagnosis registers and from central laboratory databases and reported the incidence rate of 4.8/100,000 (11). The Norwegian study collected the SLE cases from hospital diagnostic registries and only patients fulfilling 4 or more ACR criteria were included in study. The incidence rate was estimated to be 3.0/100,000 (8). The studies in the Western world have shown higher figures, but the risk population and study methods were different (4-6). We found no change in the incidence of SLE among children within two decades (8, 13-14). This study also confirmed the female predominance and the gender difference was already seen in children.

We found the highest incidence rates among 40–59-year-old females. Con-

trary to our results, many studies have shown the highest incidences in younger females at childbearing age (7, 10). There are some studies from the United Kingdom and Sweden that are in line with our results (6, 11). In an earlier population-based study in Finland in 1974–1975 using two patient series, one from the follow-up survey and the other from the Heinola town case-finding study, the incidence of SLE was estimated to be 3.8 /100,000 (9). Compared to the former data, our incident figures are lower. This may be due to change in diagnostic workout since the 1970s.

The strength of the study is that the follow up lasted several years and it covered the whole population, also children. A patient's socioeconomic status or residence has no role to the act of granting the special reimbursement for medical costs.

We may have missed some patients with fatal disease at diagnosis, mild disease with no need for antirheumatic drug treatment and patients with early incomplete SLE, who were at first entitled to reimbursed medication having an undifferentiated connective tissue disease. Although the incidence figures are based on a single source, the sensitivity of the method has been evaluated to be 95% while evaluating the incidence of inflammatory joint diseases (16). The clinical data on fulfillment of the ACR97 SLE criteria was not available. A more accurate case ascertainment with detailed data on the fulfillment of the classification criteria at diagnosis would be possible only in population-based studies with all the patients examined in a given area.

Since the study designs differ greatly, far-reaching conclusions concerning changes in incidence cannot be drawn. However, our results appear against any remarkable increase in incidence compared to that in the 1970s.

In conclusion, the estimated incidence of SLE is lower than earlier in Finland (9). The results show that incidence is higher among perimenopausal compared to reproductive aged women and confirm that SLE in children remains a rarity.

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