MORTALITY FROM SYSTEMIC LUPUS ERYTHEMATOSUS IN ENGLAND AND WALES, 1974–1983

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SUMMARY

Mortality rates from systemic lupus erythematosus (SLE) in England and Wales were estimated from Office of Population Censuses and Surveys data from 1974 to 1983, by age and sex. Age-specific average annual mortality rates showed unimodal distributions for both sexes with maximal death rates in the 65–74-year age groups. The overall age-adjusted mortality rate for females was about four times that in males, 3.94 versus 1.02 per million person-years, respectively. Examination of individual age-specific rates showed an early sharp rise in females producing female-to-male ratios which exceeded 10 in the 25–34-year age group. Age-adjusted annual mortality rates in females significantly declined during the 10-year interval studied from 4.47 to 2.99 per million person-years (p = 0.0083). These patterns of mortality from SLE observed in England and Wales are comparable to those reported among Caucasians in the United States during a similar time period.

KEY WORD: Epidemiology.

ALTHOUGH the aetiology and pathogenesis of systemic lupus erythematosus (SLE) remain unknown, important roles for the host factors of age, sex and race have been suggested by previous clinical [1–3] and epidemiologic [4–14] surveys. Studies of mortality from SLE have been reported from the United States [4, 6–11] as well as Sweden [15], Finland [16] and New Zealand [12]. Although comparisons of international mortality rates may be difficult to evaluate because of variability in classification and coding procedures of death certificates, enumeration of population denominators by census, availability of medical services and diagnostic practices of physicians, the above studies have reported average annual mortality rates from SLE ranging from 1.3 to 5.7 persons per million among Caucasians during the 1970s [6–12, 15, 16]. In addition, a temporal trend towards declining annual age-adjusted mortality rates among both Caucasians and non-whites between 1968 and 1978 has been noted in the United States [8, 9].

The present analysis was designed to estimate mortality from SLE in England and Wales from 1974 to 1983. Reported herein are: (1) the patterns of age- and sex-specific average annual mortality rates from SLE; and (2) temporal trends in sex-specific, age-adjusted annual mortality rates over the 10-year interval. These patterns and trends are largely comparable to those reported in Caucasians in the United States [6, 8, 9].

METHODS

The numbers of deaths by age and sex were tabulated from published sources for England and Wales from 1974 to 1983 [17] using the Eighth International Classification of Disease (ICD) rubric 734.1 for 1974–8 and Ninth ICD rubric 710.0 for 1979–83. Estimates of the annual mid-year population were obtained from published sources [17].

Age- and sex-specific annual mortality rates were calculated per million person-years of observation. Ten-year age groups were used except for single groups for those aged 14 and below and aged 75 and above. Crude rates were age-adjusted using the direct method with the total 10-year population of England and Wales as the standard. Standard errors of the age-adjusted rates were calculated using methods described by Chiang [18]. Mortality rates were also age-adjusted by the indirect method. Standardized mortality ratios (SMRs) were obtained by comparing the observed total 10-year number...
of deaths to that expected; the latter was calculated by applying the overall age- and sex-specific mortality rates to the total 10-year population for England and Wales. Time-trend analysis of annual sex-specific age-adjusted mortality rates was performed with Kendall's rank-order correlation coefficient, tau (T) [19].

RESULTS
Deaths in England and Wales attributed to SLE during the 10-year period studied were 1246: 1020 females and 226 males (Table).

Age-specific average annual mortality rates increased with increasing age in both sexes in a unimodal distribution with maximum rates in the 55–74-year age group in females and 65–74-year age group in males (Table, Fig. 1). In females, rates rose sharply in the 15–24-year age group and then declined in the 75-and-above age group. In males, the increase with age was more gradual, almost logarithmic, without any extreme changes during early adulthood; a similar decline was noted in the 75-and-above age group.

Mortality was consistently higher among females than males (Table, Fig. 1) but the ratio of the age-specific rates showed a dramatic rise during early adulthood and the third decade from 2.1 to 8.0 and 11.9 in the age groups 14 and below, 15–24 and 25–34, respectively. During middle age, the rate ratio was 5.9 and 5.1 in the 35–44- and 45–54-year age groups. In later years, the ratio of the age-specific rates declined to 3.7 in the 55–64-year age group and back to 2.0 for the age groups 65–74 and 75 and above.

Whereas the above analysis focused on patterns of age- and sex-specific average annual mortality rates, the remaining analysis focused on temporal trends in sex-specific, age-adjusted annual mortality rates. There was a statistically significant decline in the age-adjusted annual mortality rates from SLE between 1974 and 1983 in females from 4.47 to 2.99 deaths per million person-years (Fig. 2). Although mortality rates declined in males between 1974 and 1983 from 1.26 to 0.59 deaths per million person-years, there was not a statistically significant trend over time. This may be due to the variation in yearly rates with small changes in the numbers of deaths. Analysis of temporal trends in age-specific mortality rates in females (data not shown) revealed statistically significant declines in all age groups from age 35 to 74.

DISCUSSION
Mortality data from SLE were not tabulated in England and Wales until 1968; in that year, crude mortality rates were 1.4 and 5 per million in males and females, respectively [20]. No other systematic analyses of mortality data in England and Wales are available. Nationwide mortality data have been examined in the United States [6, 8, 9] and Finland [16] while community-based data have been examined in Sweden [15], New Zealand [12] as well as certain localities within the United States [4, 7, 10, 11].

The basic patterns of age-specific mortality rates observed in this study are largely comparable with those noted during a comparable time period among Caucasians in the United States [8, 9]. Despite the difficulties in comparing cause-specific international mortality data because of differences in attribution of cause of death and classification/coding of death certificates as well as problems in accurately enumerating population denominators, the unimodal pattern of age-specific mortality with maximum rates in the 65–74-year age group was seen in these data as well as in United States data [8, 9]. The mortality rates themselves vary little; the age-adjusted average annual mortality rate of 1.02 and 3.94 per million person-years in England and Wales between 1974 and 1983 is similar to that of 1.23 and 4.62 per million person-years in the United States between 1972 and 1976 [8]. Small differences in these rates may also be ascribed to adjustment using different
Fig. 1.—Age-specific average annual mortality rates from systemic lupus erythematosus in England and Wales, 1974–1983, by sex.

Fig. 2.—Age-adjusted annual mortality rates from systemic lupus erythematosus in England and Wales, 1974–1983, by sex and year. The number of deaths per year from 1974–1983 in females was 113, 127, 101, 106, 96, 125, 103, 78, 93 and 78 and in males was 27, 18, 24, 26, 25, 20, 30, 26, 17 and 13.
standard populations with different age distributions and/or the observed decline in mortality rates from SLE during recent years [9]. The present data also demonstrate a pattern of sex ratio of age-specific mortality rates which is comparable with that previously reported in United States data [6, 8, 9]. The marked excess female mortality, especially within the early childbearing years of 15—34, probably reflects the younger age at onset of SLE noted in clinical studies [3] and the earlier peak in incidence rates noted in epidemiological studies [4, 13, 14]. Prognosis, as measured by survival rates, does not appreciably differ between the sexes, after controlling for age at diagnosis [21, 22]. This earlier age at onset and the dramatic rise in incidence and mortality rates in females following puberty have been related to gynaecological—endocrine—hormonal factors including abnormalities in sex-hormone metabolism [23—25].

The temporal trend observed in the age-adjusted annual mortality rate from systemic lupus erythematosus in females is also comparable to that noted in the United States [9]. Several factors may be operative. For example, changes in classification and coding of death certificates, including choice of underlying cause of death, occurred in 1979 with the switch from the Eighth International Classification of Diseases to the Ninth: ICD rubrics 734.1 to 710.0, respectively. It is unlikely that this accounts for the entire declining trend based on the results of a study to determine comparability of the categories of the Eighth and Ninth ICD versions conducted by the Office of Population Censuses and Surveys [26]; 100% of 57 female and 88% of 25 male death certificates coded in ICD rubrics 716 (polymyositis and dermatomyositis) and 734 (diffuse diseases of connective tissue) based on the Eighth revision were coded in the ICD rubric 710 (diffuse diseases of connective tissue) in the Ninth revision. Another explanation might be a decline in incidence rates but there was no evidence of such a trend in incidence rates between 1970 and 1977 in Baltimore, Maryland [14] or between 1970 and 1979 in Rochester, Minnesota [13]. The most likely explanation for this trend is improved prognosis with prolonged survival in patients, probably related to more effective therapy and/or changes in the ‘natural’ history of the disease [22]. Concurrent with this improved survivorship are changes in proportionate mortality with a decline in deaths from active lupus nephritis and central nervous system involve-

ment and an increase in deaths from comorbid conditions, particularly cardiovascular disease [27, 28]. As mortality rates from SLE appear to be on the decline, further studies of patient cohorts should be directed towards improving quality of life and secondary prevention of disability and end-organ damage [29].

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REFERENCES


