Discriminants of premature mortality burden of SSc by age groups for each of 48 years, and performed jointpoint analysis to estimate annual percent change (APC) and average APC (AAPC) in the proportion of deaths by age. Second, we calculated ASMR for SSc and non-SSc causes and ratio of SSc-ASMR to non-SSc-ASMR by age groups over time, and 3) the YPLL for SSc relative to other autoimmune diseases.

Methods: This is a population-based study using a national mortality database of all United States residents from 1968 through 2015, with SSc recorded as the underlying cause of death in 46,798 deaths. First, we calculated the proportions of all United States residents from 1968 through 2015, with SSc recorded as the underlying cause of death in 46,798 deaths. Then, we performed joinpoint regression trend analysis to estimate annual percent change (APC) and average APC (AAPC) in the proportion of deaths by age. Second, we calculated ASMR for SSc and non-SSc causes and ratio of SSc-ASMR to non-SSc-ASMR by age groups for each of 48 years, and performed jointpoint analysis to estimate APC and AAPC for these measures (SSc-ASMR, non-SSc-ASMR, and SSc-ASMR/non-SSc-ASMR ratio) by age. Third, to calculate YPLL, we divided the decedent's age at death from a specific disease by an arbitrary age limit of 75 years for years 2000 to 2015. The years of life lost were then added together to yield the total YPLL for each of 13 preselected autoimmune diseases.

Results: 23.4% of all SSc deaths as compared to 13.5% of non-SSc deaths occurred at <45 years age in 1968 (p<0.001, Chi-square test). In this age group, the proportion of annual deaths decreased more for SSc than for non-SSc causes: from 23.4% in 1968 to 5.7% in 2015 at an AAPC of -2.2% (95% CI, -2.4% to -2.0%) for SSc, and from 13.5% to 6.9% at an AAPC of -1.5% (95% CI, -1.9% to -1.1%) for non-SSc. Thus, in 2015, the proportion of SSc and non-SSc deaths at <45 year age was no longer significantly different. Consistently, SSc-ASMR decreased from 1.0 (95% CI, 0.8 to 1.2) in 1968 to 0.4 (95% CI, 0.3 to 0.5) per million persons in 2015, a cumulative decrease of 60% at an AAPC of -1.9% (95% CI, -2.5% to -1.2%) in <45 years old. The ratio of SSc-ASMR to non-SSc-ASMR also decreased in this age group (cumulative -20%, AAPC -0.3%). In <45 years old, the YPLL for SSc was 65.2 thousand years as compared to 43.2 thousand years for rheumatoid arthritis, 18.1 thousand years for dermatomyositis, 146.8 thousand years for myositis, and 241 thousand years for type 1 diabetes.

Conclusion: Mortality at younger ages (<45 years) has decreased at a higher pace for SSc than from all other causes in the United States over a 48-year period. However, SSc accounted for more years of potential life lost than rheumatoid arthritis and dermatomyositis combined. These data warrant further studies on SSc disease burden, which can be used to develop and prioritize public health programs, assess performance of changes in treatment, identify high-risk populations, and set research priorities and funding.

References:

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