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## LESS IS MORE

### Incidence of Physician-Diagnosed Carpal Tunnel Syndrome in the General Population

Carpal tunnel syndrome (CTS) is a common cause of upper-extremity disability.<sup>1</sup> Moderate to severe CTS often requires carpal tunnel release (CTR) surgery. A few studies have estimated the incidence of CTS, showing large differences between countries.<sup>2,3</sup> Intercountry variations in incidence of surgery may reflect differences in CTS incidence and/or in use of surgical treatment. It is unknown whether such differences are age or sex related. In the present study, we estimate the incidence of physician-diagnosed CTS and surgery in the general population in southern Sweden and compare it with corresponding incidence in a US general population.

**Methods.** The Skåne Health Care Register (SHCR) is a comprehensive inpatient-outpatient register for Skåne County in southern Sweden (1.2 million inhabitants, one-eighth of Sweden's population). The SHCR covers all public health care providers (primary to tertiary) but not private physicians, accounting for 30% of patient visits.<sup>4</sup> We retrieved SHCR data on all county residents who received a physician-made CTS diagnosis during 6 years (2003-2008). Persons with a first-time CTS diagnosis during the last 3 years (2006-2008) were considered incident cases. To account for cases exclusively diagnosed and managed by private physicians, incidence estimates were adjusted by reducing the at-risk population by 20% (level chosen because approximately one-third of patients cared for by private physicians are treated for the same condition by SHCR-covered physicians).<sup>5</sup>

Incidence of surgery was based on residents of Skåne County's northeastern district (170 000 inhabitants) treated at the district's only orthopedic department (Hässleholm-Kristianstad), where virtually all CTR procedures are performed. All surgeon-registered procedures are verified against an anesthesia register. We calculated the incidence of CTR surgery over 10 years (1999-2008) and of CTS in same population (2003-2008).

We calculated overall incidence assuming that adults are the at-risk population, with each person counted once. Differences between sexes were explored using Poisson regression.

We compared the incidence of physician-diagnosed CTS and CTR surgery in southern Sweden with the incidence of medically diagnosed CTS and CTR surgery in Olmsted County, Minnesota (2001-2005).<sup>3</sup> The US estimates, based on new cases identified through a medical records linkage system, were age-adjusted to the 2000

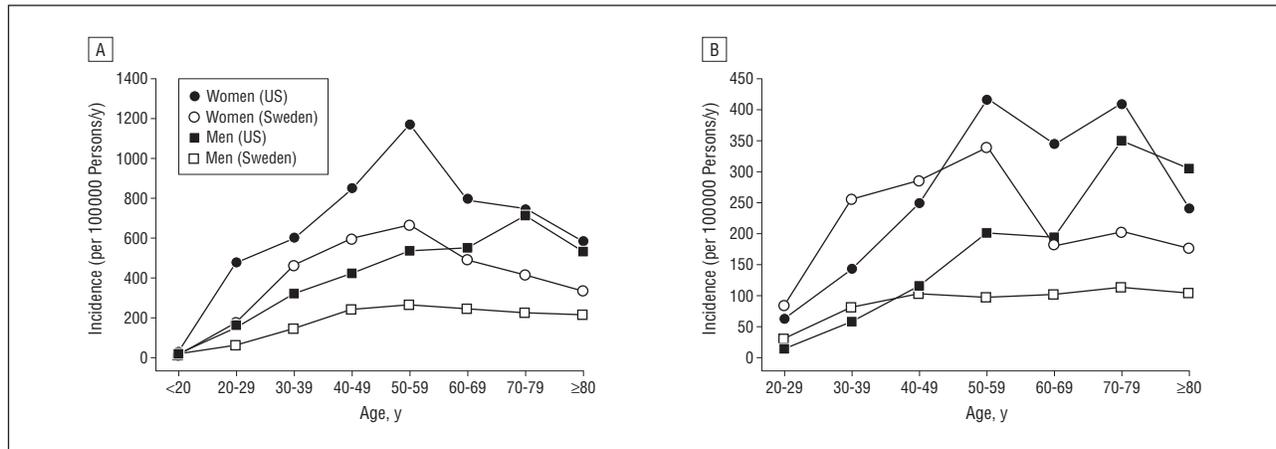
US standard population. For this comparison, we standardized our incidence to the same standard.

**Results.** During 6 years (2003-2008), physician-diagnosed CTS was recorded at 80 309 consultations (primary diagnosis, 94%) in 14 264 individuals (primary diagnosis, 88%). The annual incidence (95% confidence interval [CI]) was 428 (416-440) in women and 182 (174-190) in men per 100 000 adults, peaking among women aged 45 to 54 years. The female to male incidence ratio (95% CI) was 3.1 (2.8-3.4) in those aged 18 to 44 years, 2.7 (2.4-3.0) in those aged 45 to 54 years, 2.1 (1.9-2.4) in those aged 55 to 64 years, and 1.5 (1.4-1.7) in those 65 years or older.

In the northeastern district, 1489 women and 554 men had CTR surgery (1999-2008); the annual incidence (95% CI) was 220 (209-231) in women and 85 (78-92) in men per 100 000 adults. The female to male incidence ratio (95% CI) was 3.0 (2.6-3.3) in those younger than 65 years and 1.7 (1.4-2.1) in those 65 years or older. Surgery was used in 33% in those younger than 35 years, 50% in those aged 35 to 74 years, and 60% in those 75 years or older. During the 10 years, 393 women (26%) had a subsequent contralateral CTR procedure (70% within 1 year) and 44 (3%), a repeated CTR procedure, and 143 men (26%) had a contralateral CTR procedure (75% within 1 year) and 16 (2.9%), a repeated CTR procedure.

The US-standardized annual incidence of CTS per 100 000 persons (all ages) among women was 324 in Sweden compared with 542 in US and among men 125 compared with 303. The incidence was higher in the United States than in Sweden in all age groups (**Figure, A**). Among women, the US-standardized annual incidence of CTR surgery per 100 000 persons (all ages) was 166 in Sweden compared with 171 in the United States, and among men, 58 in Sweden compared with 96 in the United States. In those 20 years or older, the incidence (95% CI) was 227 (215-239) vs 243 (224-264) among Swedish vs US women and 83 (76-91) vs 128 (114-145) among Swedish vs US men. The incidence among women younger than 50 years was higher in Sweden, but among women 50 years or older, incidence was higher in the United States; among men younger than 50 years, incidence was similar, but in the United States, in those 50 years or older, incidence was double that in Sweden (**Figure, B**).

**Comment.** Physician-diagnosed CTS was common in the general population, and almost half were treated surgically, more frequently elderly patients. The incidence of CTS was substantially higher in the United States than in Sweden, and surgical incidence was substantially higher among US men. Factors behind these differences are unknown. The US-standardized incidence of CTS in the Netherlands<sup>6</sup> was similarly lower than in the United States.<sup>3</sup> The annual incidence of surgery in Sweden and the United States is considerably higher than in the United Kingdom in 2000 (59 per 100 000 women and 27 per 100 000 men).<sup>7</sup> Intercountry variations may reflect true differences in CTS incidence or factors influencing the extent individuals with CTS seek health care and receive diagnosis. Research has shown higher prevalence of CTS with overweight or obesity<sup>1,8</sup> and in certain occupational groups or activities<sup>9</sup>; thus, differences in obesity and in occupational characteristics



**Figure.** Age-specific annual incidence rates. A, Age-specific annual incidence of physician-diagnosed carpal tunnel syndrome in the general populations of Skåne County, Sweden (2006-2008), and Olmsted County, Minnesota (2001-2005).<sup>3</sup> B, Age-specific annual incidence of carpal tunnel release surgery in the general populations of Skåne County's northeastern district, Sweden (1999-2008), and Olmsted County, Minnesota (2001-2005).<sup>3</sup>

or work rules may influence incidence of CTS. Intercountry differences in incidence could also reflect differences in CTS-associated disorders such as diabetes and inflammatory joint diseases.

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**Author Contributions:** Dr Atroshi had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. *Study concept and design:* Atroshi, Englund, and Petersson. *Acquisition of data:* Atroshi, Englund, and Petersson. *Analysis and interpretation of data:* Atroshi, Englund, Turkiewicz, Tägil, and Petersson. *Drafting of the manuscript:* Atroshi and Petersson. *Critical revision of the manuscript for important intellectual content:* Atroshi, Englund, Turkiewicz, Tägil, and Petersson. *Statistical analysis:* Atroshi, Englund, and Turkiewicz. *Obtained funding:* Atroshi and Petersson. *Administrative, technical, and material support:* Petersson. *Study supervision:* Englund and Petersson.

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## HEALTH CARE REFORM

### A Quantitative Analysis of Adverse Events and "Overwarning" in Drug Labeling

Product labeling is a primary source of drug safety information for physicians. However, the effectiveness of labeling in communicating adverse drug events (ADEs) may be diminished by the problem

*See Invited Commentary  
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of "overwarning," in which excessively long and complex lists of potential reactions can result in information overload.<sup>1,2</sup> The Food and Drug Administration (FDA) highlighted this issue in 2006 as they unveiled new la-