

## MS Women References

1. Barnett MH, Williams DB, Day S, Macaskill P, McLeod JG (2003) "Progressive increase in incidence and prevalence of multiple sclerosis in Newcastle, Australia: a 35-year study" *Journal of Neurological Sciences*, 213, 1-6.

A significant increase in prevalence over time, although it is not clear the extent to which this reflects better case ascertainment or differential migration of people from high risk populations (Hammond et al, 1987; Hammond et al, 1988b). Prevalence in Newcastle has risen by 272% for females and 74% for men from 1961 to 1996 (Barnett et al, 2003). The rise was attributed to increased incidence, particularly among females, and to increased survival rates. The 1996 study of prevalence in the ACT found unexpectedly high levels of MS, compared to results then available (1981) of prevalence in Newcastle, a city of similar latitude. Subsequent publication of MS prevalence in Newcastle (Barnett et al, 2003) during 1996 in fact shows very similar results between the two cities at the later date.

2. Dahl OP, Aarseth JH, Myhr KM, Nyland H, Midgard R. Multiple sclerosis in Nord-Trøndelag County, Norway. A prevalence and incidence study. *Acta Neurol Scand* 2003 DOI: 10.1046/j.1600-0404.2003.00244.x © Blackwell Munksgaard 2003.

Objective –To calculate the prevalence and incidence of multiple sclerosis (MS) in Nord-Trøndelag County, Norway.

Material and methods –The study comprised everyone diagnosed with MS according to the Poser criteria. On 1 January 2000 a total of 208 were identified: 130 women (62.5%) and 78 men (37.5%). We calculated the crude and age-adjusted annual incidence rates from 1974 to 1999.

Results –The prevalence on 1 January 2000 was 163.6 of 100,000, 204.8 of 100,000 for women and 122.6 of 100,000 for men. The age-adjusted annual incidence increased from 3.9 to 5.6 per 100,000 from 1974 to 1999; women from 4.6 to 6.3 and men from 2.2 to 4.4. After 1984, the incidence among women increased most, peaking at 10.2 per 100,000 in 1984–88.

Conclusions –MS incidence is increasing in Nord-Trøndelag County. The prevalence is among the highest ever in Norway.

3. Noonan CW, Kathman SJ, White MC (2002) "Prevalence estimates for MS in the United States and evidence of an increasing trend for women" *Neurology* 58:136-138.

Throughout the world, the prevalence of MS also appears to be increasing over time. It appears that the observed increase in prevalence of MS may reflect a real increase in the incidence of the disease, as well as the impact of other factors such as better diagnostic testing (including MRI) and case ascertainment or increased survival rates. Studies in North America, Scandinavia and Sardinia have concluded that observed increases in incidence are real, and not the result of methodological issues

Noonan et al (2002) observed a particularly significant trend increase in incidence of MS for women.

4. Hernan MA, Jick SS, Logroscino G, Olek MJ, Ascherio A, Jick H "Cigarette smoking and the progression of multiple sclerosis." *Brain*. 2005 Jun;128(Pt 6):1461-5. Epub 2005 Mar 9.

**Summary** An increased risk of multiple sclerosis among smokers has been found in several prospective epidemiological studies. The association between smoking and progression of multiple sclerosis has not been examined. We identified patients who had a first multiple sclerosis diagnosis recorded in the General Practice Research Database (GPRD) between January 1993 and December 2000. Their diagnosis and date of first symptoms were confirmed through examination of medical records. Smoking status was obtained from the computer records. These results support the hypothesis that cigarette smoking is associated with an increased risk of multiple sclerosis, and suggest that smoking may be a risk factor for transforming a relapsing-remitting clinical course into a secondary progressive course.

"Compared with non-smokers, smokers had a 40-80% increased risk of multiple sclerosis in the four previously conducted prospective studies (all restricted to women)," write Miguel A. Hernán, MD, from the

Harvard School of Public Health, in Boston, Massachusetts, and colleagues. "On the other hand, there are no epidemiological studies on the association between cigarette smoking and the clinical course of multiple sclerosis. Since no modifiable risk factors for multiple sclerosis progression have been identified so far, determining whether cigarette smoking affects the course of multiple sclerosis appears to be a priority." The investigators identified patients with a first diagnosis of MS recorded in the British General Practice Research Database (GPRD) between January 1993 and December 2000. They confirmed the diagnosis and date of first symptoms by medical record review and obtained smoking status from the computer database.

- Mean age was 36 years, 70% were women, and mean number of health care encounters before the index date was 21 visits annually. Mean yearly number of health care visits after the index date was 45 for those with MS and 24 for the case control subjects.
- Of those with MS, 79% had a relapsing-remitting disease course. 51% first presented with sensory symptoms, 25% first presented with optic neuritis or diplopia, and 19% first presented with motor deficits or weakness.
- The analysis of smoking and MS onset included 201 patients with MS and 1,913 matched control subjects.
- Among those who ever smoked, the proportion of women was 66.3% and mean age at appearance of first symptoms was 36.3 years.
- When patients with possible MS were included, the incidence ratio of progression for ever vs never smokers was 3.4.
- In patients with MS whose disease has a relapsing-remitting clinical course, the risk of developing secondary progression is more than three times higher in smokers than in nonsmokers.