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RESEARCH LETTER

Editor's Choice – Continued Declining Prevalence of Screening Detected Abdominal Aortic Aneurysms in 65 Year Old Swedish Men

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Randomised trials conducted in the 1990s convincingly demonstrated the effectiveness of ultrasound screening for abdominal aortic aneurysm (AAA) in men.[1] This formed the basis for the introduction of population screening targeting AAA among 65 year old men in Sweden in 2006 and the UK in 2008, and other countries subsequently followed. In the Swedish screening programme, a total prevalence of 2.2% (1.7% screening detected and 0.5% already known AAAs) was initially reported,[2] significantly lower than the 4 – 7% previously found in trials.[1] A significantly reduced smoking frequency and better cardiovascular prevention strategies are believed to have contributed to the reduction of AAA in the population.[2,3] Modelling studies have shown that AAA screening maintains its cost effectiveness even if the prevalence of disease is as low as 0.5%,[4] thus continued screening activity could still be justified. Yet a sustained reduction in smoking and further improved cardiovascular prevention in the population makes a further reduction in the incidence of AAA likely. There is, however, lack of published data on how this has developed over the last 10 years.

The aim of this study was to report the latest time trend and current AAA prevalence in a population based screening setting in middle and northern Sweden.

The Swedish AAA screening programme started in Uppsala in 2006 and other counties gradually followed to reach national coverage in 2015. All men are invited to an ultrasound examination of the abdominal aorta when turning 65 years old. An AAA is defined as a maximum leading edge to leading edge diameter $\geq$ 30 mm. Local screening data from three counties in middle Sweden, namely Uppsala (2006 – 2022), Gävle (2009 – 2022), and Dalarna (2008 – 2022), as well as Västerbotten (2009 – 2022) in northern Sweden were collected. The population in the four counties constitutes 12% of Sweden's total population of just over 10 million and constitutes a representative sample of the entire population.

During the study period, a total of 111 242 men born between 1941 and 1957 were invited to screening in the four counties, of which 94 835 (85.3%) accepted. The high attendance rate was similar in the four counties and was stable over time. During the COVID-19 pandemic (2020 – 2021), screening activity was temporarily reduced at times for safety reasons, but with a maintained high attendance rate among those invited during that period; thereafter, the screening activity was increased to catch up on the target population.

A total of 1 342 (1.4%, 95% confidence interval [CI] 1.3 – 1.5%) AAAs $\geq$ 30 mm were detected, of which 151 (11.3%, 95% CI 9.6 – 12.9%) measured $>$ 50 mm at screening. The AAA prevalence declined steadily during the study period (Mantel–Haenszel χ^2 for linear trend 47.6, $p \leq .001$) (Fig. 1A). Over the past four years a mean prevalence of 1.0% or lower has been noted in the four counties, with the lowest prevalence down to 0.5% observed in Uppsala. Furthermore, the proportion of screening detected AAAs $>$ 50 mm decreased significantly during the study period (Mantel–Haenszel χ^2 for linear trend 15.7, $p \leq .001$) (Fig. 1B).

The observed linear downward trend in AAA prevalence in the present study is congruent with historical data from the 1980s onwards and suggests a sustained and ongoing decline in recent decades. The falling prevalence of AAA strictly follows the smoking trend in the population. In 1980, 35% of the adult male population smoked, by 2008 it had dropped to 13%, and in 2022 to $<$ 9% (Statistics Sweden; https://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__LE__LE0101__LE0101H/LE01012021H06/). In addition, cardiovascular risk factor management and treatment have improved significantly in the population during this time. In 2022, 55% of 59 – 69 year old men were prescribed antihypertensive medications and 35% statins (Statistics Sweden; https://sdb.socialstyrelsen.se/if_lak/resultat.aspx).

Each individual county showed a significantly decreasing prevalence over time, despite variations and differences in prevalence within and between counties, which indicates that the observation of a declining AAA prevalence is robust. The sharp decline in the proportion of screening detected AAA $>$ 50 mm further reinforces the impression that the development of AAA is indeed decreasing across the board,

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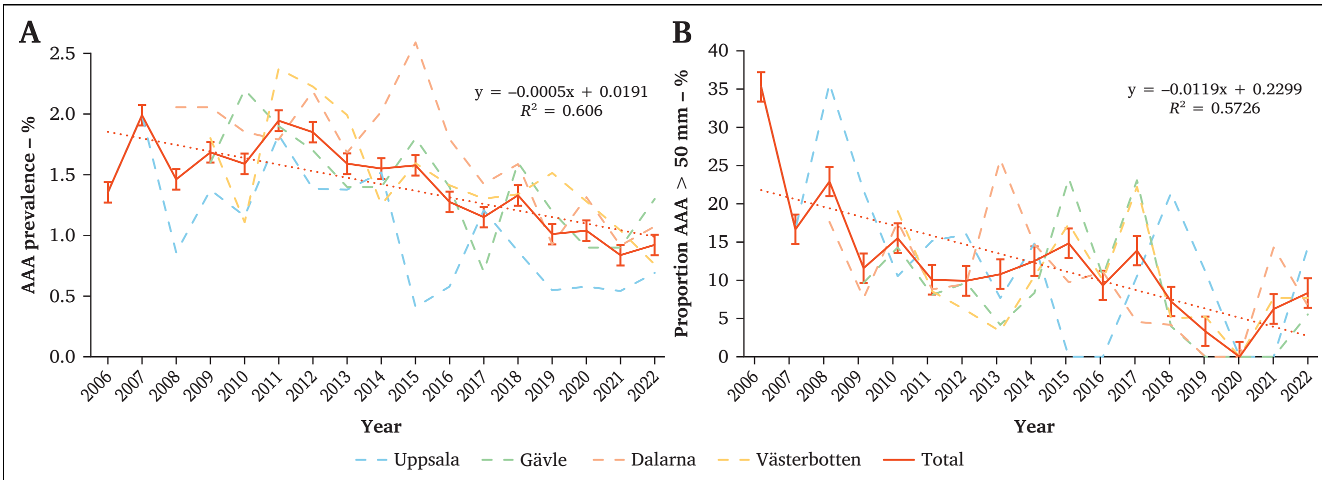

Figure 1. (A) Prevalence of screening detected abdominal aortic aneurysm (AAA) in 65 year old men 2006 – 2022 in Sweden. (B) Proportion of screening detected AAA > 50 mm.

both in number and severity. The population based study design and high attendance rate, together with a uniform screening methodology, make these results reliable. Its generalisability outside Sweden may, however, be limited by any epidemiological differences between populations. It is nevertheless likely that AAA prevalence will continue to decrease with the expected continued reduction in smoking and further implementation of early cardiovascular preventive treatments. An increased incidental detection rate through a more widespread use of diagnostic imaging further reduces the value of population screening. This has implications for the planning and design of both ongoing AAA screening programmes and future initiatives, which probably need to be redesigned to target relevant high risk groups of today. What constitutes a suitable target group may, however, differ between settings depending on the local risk factor profile and healthcare structure, and should be defined locally as recommended in the latest European Society for Vascular Surgery (ESVS) AAA guidelines.[5] Furthermore, the appropriate age for screening may also need to be reconsidered in light of the increasing longevity of the population. The integration of AAA screening with broader cardiovascular screening interventions may increase the health benefit of screening and warrants further research.

CONFLICTS OF INTEREST STATEMENT AND FUNDING

None declared.

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