A recent article suggested that screening for abdominal aortic aneurysm (AAA) might cause more harm than good. Johansson et al.\textsuperscript{1} reported that if 10,000 men were invited for screening, 46 AAA deaths would be prevented over 13—15 years, but 176 men would have a small aneurysm (greater than 3 cm) diagnosed that would never require treatment. According to Johansson, this second group are said to be “overdiagnosed,” incurring a risk of psychological morbidity\textsuperscript{2} without the benefit of a reduced risk of AAA-related mortality. The concept of overdiagnosis is important. Its basis lies in the debatable balance between benefit and harm that remains central to healthcare ethics; however, a precise definition is lacking. Johansson suggests that for AAA, anyone (following screening) who is diagnosed with an aneurysm that would never have caused any symptoms (or death) should be defined as being overdiagnosed, and that this represents the “most serious harm.”

Central to this issue is the balance of illness/preventable death and quality of life. Five observational studies\textsuperscript{2—6} have investigated quality of life (QoL) in those who are screened positive for AAA, with one reporting short-term decreases in QoL at 1 year and four demonstrating no clinically important decrease in QoL in those screened positive compared with an unscreened control group. It is plausible that some patients are heavily burdened by a positive diagnosis; however, it should also be considered that many patients are reassured by a negative screen result while others may see a diagnosis of a 3—5.5 cm AAA as an opportunity to treat a life threatening disease that may otherwise have been missed. Patients decide whether or not to attend their screening appointment and current evidence does not point towards excess psychosocial harm from screening, although further studies utilising AAA-specific quality of life instruments are needed.

Preventing “illness” is equally important to the balance of overdiagnosis. A systematic review for the U.S. Preventive Services Task Force\textsuperscript{7} concluded that AAA screening in men aged 65 years or older was associated with decreased AAA rupture and AAA-related mortality rates, but had little effect on all-cause mortality. In contrast, Lindholt et al.\textsuperscript{8} examined the pooled effects of AAA screening on all-cause mortality, finding a significant reduction in mortality (OR 0.94, 95% CI 0.92—0.97), while the 13-year follow-up from the Multicentre Aneurysm Screening Study\textsuperscript{9} (MASS) reported an overall reduction in all-cause mortality of 3%. AAA screening may therefore reduce both aneurysm and all-cause mortality.

Causes of non-aneurysm death were addressed within the MASS trial\textsuperscript{7} which demonstrated similar causes of death in the invited and control groups, chiefly from ischaemic heart disease (8.7% vs. 9.0%, respectively), stroke (2.7% for both), and cancer (14.0% vs. 14.1%, respectively). An early diagnosis of AAA (through screening) is increasingly being recognised as an important marker of cardiovascular risk giving screened patients the opportunity to modify their risk of heart disease\textsuperscript{10} and stroke through the best medical therapy, smoking cessation, weight loss, and regular exercise. Furthermore, new therapeutic agents, such as PCSK9 or P2Y12 inhibitors, have the potential to improve the effectiveness of secondary cardiovascular prevention strategies and further improve the health of patients with a small AAA. This would increase the benefits of early diagnosis, irrespective of whether a patient ultimately requires an AAA repair or not. Therefore, up-to-date studies regarding the effect of AAA screening on all-cause mortality may reflect these improvements in overall care.

Fundamental to the risk of overdiagnosis raised by Johansson is unnecessary preventive surgery. Those authors estimate that if 94 men did not have surgery for their screen proven AAA, 57 would have ruptured, from which 44 would have died. Thus 37 (95% CI 15—60) had “unnecessary” preventive surgery. Predicting those aneurysms that will rupture is not currently achievable, and such a strategy would place patients at unacceptable risk. The potential risks of surgery can, however, be reduced. In the UK, an AAA Quality Improvement Programme was implemented in 2008 which reduced mortality rates following elective AAA repair from 7% to 2.4% by 2013.\textsuperscript{11} Present mortality may be lower than 1%.\textsuperscript{12,13} Current practice is to consider intervention on aneurysms of 5.5 cm or greater (screened or un-screened) and there is no evidence that the risk of rupture at 5.5 cm has been affected by risk factor modification.

Risk factor modification has, however, likely played a part in the declining prevalence of AAA. Johansson highlights the important issue of cost-effectiveness of AAA screening within this changing epidemiology, but fails to acknowledge the latest evidence in this area. Utilising long-term data from MASS, Glover et al.\textsuperscript{14} demonstrated that (despite increased costs and a lower prevalence), AAA screening in the UK remained highly cost-effective, with similar findings published by Svensjö et al.\textsuperscript{15} in Sweden.
Curiously, Johansson et al. suggest that a screening programme “doubles” the prevalence of AAA. The screening program exists to identify people with aneurysmal aortas who were previously “unknown” and, although this does not increase the number of people with aneurysms, it does increase the number of which we are aware. Finally, the authors raise concern over the debate to include sub-aneurysmal aortic dilation (2.5—2.9 cm) within the screening program. Although there is evidence\(^{13}\) that some of these patients may progress to develop an aneurysm at 10 years, it remains unclear whether these patients would benefit from a modified form of surveillance; for example with a repeat scan at 70 years.\(^{13}\)

The definition of “overdiagnosis” in AAA remains to be established and careful discussion is required among clinicians, decision-makers, and patients to find the correct balance. In an effort to find clinically relevant AAA, it is likely that a number of patients are found whose aneurysms will not develop or cause future symptoms; however, we would argue that the most serious harm comes not from overdiagnosis, but from exposing patients to the life-threatening consequences of aneurysm rupture when this could have been prevented.

REFERENCES


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