EDITORIAL

Screening, surgical repair, and the management of abdominal aortic aneurisms

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Abdominal aortic aneurysm (AAA) is a detectable, treatable disease, and yet over 6000 people in the UK still die from it each year.[1] Elective open surgical treatment is the only method of prevention. Its use needs to be tempered by three facts: it is a treatment that itself carries a mortality risk (2–6%);[2–4] the majority of those with an AAA die of other causes with their aneurysm intact[5] and so would not benefit from the treatment; and the risk of rupture of an AAA of 5 cm diameter (around 1% per year)[3,6] is less than the risk of surgery. Surgery should therefore only be offered when there is a clearly favourable risk–benefit ratio,[7] so as to reduce to a minimum the number of unnecessary operations on those who, if left, would die with their aneurysm intact.

Progress in anaesthesia and surgical techniques has improved outcomes for elective procedures but not the outcomes of emergency treatment.[8,9] When combined with the observation that a large proportion of patients with ruptured AAA will die before reaching a hospital operating theatre,[10,11] it is apparent that any technical advance is unlikely to significantly alter the mortality of disease as a whole without early detection in the community. Screening for AAA using ultrasound achieves this and has been shown to both save lives and be cost-effective.[12,13]

The evidence of this benefit has accumulated over the past 20 years.[14–18] Small randomized controlled trials[19,20] and non-randomized studies[15,21] suggested benefit, but it was not until 2002 that clear evidence of the benefit emerged, as well as demonstration of cost-effectiveness, with publication of the results of the Multicentre Aneurysm Screening Study (MASS).[12,13]

One recent large randomized trial from Australia[22] appeared, from their conclusion, not to demonstrate benefit. Close inspection of the published findings showed that, for the same age group that was studied in MASS (65–74 years), the reduction in AAA-related mortality, when compared from the point of screening onwards, was in fact greater (81%) than that found in MASS (42%). The overall reduction in AAA mortality calculated from their data (39%) was very similar to the three other trials,[13,19,20] although the reduction was not statistically significant. The lack of statistical significance was due to a lack of power, rather than a lack of effect. Relative to MASS, the population recruited was smaller (40,000 rather than 70,000), there were long delays between randomization and screening (leading to additional deaths from ruptured AAA in the screening arm), and inclusion of an extra tranche of 80 + year-old men to boost the numbers led to the low benefit and high rupture rate associated with this age group.

Screening men just once in a lifetime, at age 65, would halve the risk of rupture in those who attend screening, leaving a population with a normal aorta (95% of those screened) with a very low risk of rupture (0.6 per 10,000 person-years); this low risk appears to last for 10 years or more.[23,24]

Reduction in the mortality associated with treatment would widen the indications for screening and improve the benefit. Endovascular aneurysm repair (EVAR) has a lower 30–day mortality than open repair,[25,26] but complications, re-operation and device failure appear to require further assessment.[27,28] If the high complication rate can be eliminated by device and technique improvement[29] then EVAR could decrease the mortality and improve the benefit of screening. The biggest problem to overcome is the 1% rupture rate per year,[30] which is not dissimilar to no treatment of an AAA 5 cm in diameter.[3,6]

The ideal combination would be to identify AAAs by screening and then prevent their expansion by a medical/non-surgical treatment. Research into the aetiology of AAA[29] and the causes of expansion[32,33] has the potential to achieve this aim, but no specific non-surgical interventions are available as yet.

The consistent findings of four randomized controlled trials[13,19,20,22] strongly support the earlier evidence that screening and elective treatment can reduce the mortality and the emergency surgical workload from this disease. The US Preventive Services Task Force recently reviewed the evidence and has recommended 'one-time screening for AAA by ultrasonography in men age 65–75 years who had ever smoked'.[34] In the UK the National Screening Committee is also reviewing the evidence, and will give its decision in the near future. Let us hope that after producing much of the evidence, the UK and countries in Europe will also be offered the opportunity to benefit from widespread AAA screening.

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