

VASCULAR DISEASE

Disparities in treatment and mortality from ruptured AAA between England and the USA

In-hospital mortality from ruptured abdominal aortic aneurysm (rAAA) is higher in England than in the USA. In addition, patients in England are less likely to be offered corrective treatment (open surgery or endovascular aneurysm repair [EVAR]) than those in the USA. Among patients who do undergo intervention, operative mortality is similar in the two countries. These findings, from a comparison of administrative data, have been published in *The Lancet* by a team from St George's Vascular Institute, London, UK. "The premise of this study was that a comparison of international practice might provide context for UK practice, and identify common factors or differences in the way that care for rAAA is delivered that influence patient outcomes," explains vascular surgeon Mr Peter Holt, who was one of the investigators. "If such factors could be identified then these could provide modifiable targets to improve patient care."

The prevalence of AAA in the general population is greater in men than in women and increases with age. Small AAAs (≤ 30 mm) are usually clinically benign. However, larger (>50 mm) aneurysms can carry a risk of rupture that, although rare, is a critical and often fatal event.

The researchers compared data from 11,799 patients in England and 23,838 in the USA who experienced a rAAA

between 2005 and 2010. Patients were typically male (74% in England and 71% in the USA) and in their mid-70s (mean age 78 years in England and 77 years in the USA). The primary outcome measures investigated were in-hospital mortality, postintervention mortality, and the incidence of noncorrective treatment (that is, management that did not involve open surgery or EVAR).

Intervention for rAAA was offered to 58.5% of patients in England compared with 80.4% in the USA ($P < 0.0001$). In addition, EVAR was more than twice as common in the USA than in England (20.9% versus 8.5%; $P < 0.0001$). "The more active treatment of aortic rupture in the USA than England ... is mainly linked to the increased centralization and availability of EVAR," write Martin Björck and Kevin Mani (Uppsala University, Sweden) in an accompanying *Lancet* editorial. "The main benefit of EVAR for rAAA might be the possibility to treat elderly patients, [those] with comorbidities, or both, who would not otherwise be considered candidates for open surgery." Despite the higher rate of EVAR in the USA, "about 50% of patients with rAAA are morphologically suitable for EVAR," write the investigators, "yet the use of EVAR in both countries remains short of this benchmark." Professor Janet Powell (Imperial College London, UK), who was not involved in the study, points out that "in both the USA and England, there is a systematic bias against offering surgery to women of all ages, which was not highlighted in this article". The sex-adjusted analysis from the study shows that, in both countries, women were less likely than men to be given corrective treatment for rAAA.

The increased use of open surgery and EVAR in the USA was associated with decreased in-hospital mortality compared with England (53.1% versus 65.9%; $P < 0.0001$). In their discussion, the investigators include the caveat that in-hospital mortality data should be

interpreted with caution, "to acknowledge the risk of confounding by different discharge policies", and suggest that future research should focus on 90-day outcomes. "Recovery from rAAA depends on teamwork from many disciplines," comments Professor Powell. "The type of anaesthesia used may be as influential [in patient outcomes] as the type of surgery (open or endovascular) offered."

Other intriguing findings from the study include the lower mortality (in both countries) among patients treated on weekdays than at weekends, and among patients who were treated at hospitals affiliated with a teaching institution. In the USA, 51.5% of patients with rAAA were treated at a teaching hospital compared with 29.3% in England, despite the proportion of teaching to nonteaching hospitals being similar.

"The findings provide a strong confirmatory argument for the necessity for centralization of emergency AAA services, the delivery of EVAR, and a review of the selection criteria for intervention," says Mr Holt. "The St George's Department of Outcomes Research is now working towards developing a robust ongoing collaboration with a major USA health services research unit. This will allow a number of detailed comparisons of US and UK health-care systems to be performed, with the aim of improving patient outcomes." Professor Powell believes that "it may be difficult to tease out ... the way to improve the outcomes and quality of care for this condition. These data need to be used together with more reliable registry and trial data to suggest ways in which the quality of care can change to improve outcomes."

Alexandra Roberts

Original article Karthikesalingam, A. *et al.* Mortality from ruptured abdominal aortic aneurysms: clinical lessons from a comparison of outcomes in England and the USA. *Lancet* 383, 963–969 (2014)



XiXinXing | Thinkstock