Heart valve disease: aortic stenosis

Under-recognized, under-treated

Every year, thousands of people are at risk from a silent killer that often goes unrecognised by both patients and their doctors. Aortic stenosis (AS) is the most common form of valvular heart disease (VHD) in Europe and North America, thought to affect 2-7% of people aged over 65 years.[1–4] The condition is potentially lethal.

Once AS symptoms occur, prognosis is dismal without treatment. Only around half of those who develop AS symptoms remain alive after five years, while many die suddenly, within two to three years of diagnosis.[4–6]

Of greater concern is that the condition typically has a slow, insidious onset, with few symptoms or signs. This is called "asymptomatic AS", [4,7] and although the disease may be latent, this does not mean that it is harmless. All too often the condition is not picked up in time to intervene and avoid the risks posed by sudden, serious and potentially life-threatening cardiac events.[8,9]

Even when AS is diagnosed, there is evidence that there are gaps between the treatments patients receive and those recommended by evidence-based guidelines.[1,4,6,10,11] For every AS patient referred to a cardiac surgeon, there is another patient with severe AS who is not referred, and less than half of those referred subsequently undergo surgical aortic valve replacement (AVR) – the guideline-recommended treatment of choice.[11]

Progressive but silent

Epidemiological studies identify a striking relationship between AS and advancing age, with estimates suggesting that by the age of 75, the prevalence of moderate to severe AS is over 13%.[3]

Aortic stenosis is most often due to age-related degeneration or hardening (calcification) of the aortic valve, leading to progressive narrowing (stenosis) or leakage – changes which compromise valve function and impair normal blood flow through the heart.

The true case-load and burden of AS has proved hard to quantify, since most reports of disease incidence and prevalence have focused on hospital patients with a known diagnosis of AS and do not capture the potentially larger number of silent, asymptomatic cases of AS.[1,3,12]

Diagnosis often missed

Multiple reasons compound to cause the under-diagnosis and under-treatment of AS. A major factor is the typically silent and slow progression of VHD. Clinical symptoms of AS, if present at all, can be fairly non-specific – shortness of breath on exertion, dizziness, fainting, symptoms of angina – and may be attributed to other co-existing conditions, ascribed to normal ageing, or even denied by patients as they subconsciously reduce their activities to compensate for these symptoms.[4]

Another factor is that a definitive AS diagnosis is complex. The characteristic heart 'murmur' (systolic murmur) which should draw attention to possible AS and guide further diagnostic work can be faint or difficult to interpret for community-based practitioners.[2,4,10] Even in hospital settings, it is believed that AS is often overlooked and undertreated.[1,10]

Aortic valve replacement (AVR) – the treatment of choice

Current clinical guidelines on the management of AS make a clear distinction between AS that is symptomatic and AS that is asymptomatic – however what they identify is the need to treat severe AS.

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Without treatment, patients with severe AS face reduced longevity, and impairments in physical and social functioning and emotional well-being that contribute to poor quality of life.[6,10,13,14]

The European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS) guidelines recommend aortic valve replacement (AVR) as the definitive therapy for severe AS,[4,10] but there is widespread recognition that AS is not being detected early enough to allow optimal and timely intervention. Evidence suggests that even when recognised and correctly diagnosed, many patients do not receive optimal treatment.[1,2,10,11]

Late referral and under-use of AVR

Currently, many AS patients are referred for surgery too late, at a time when the disease has advanced to a stage where there are increased risks associated with AVR or when long-term post-surgical outcomes may be suboptimal.

A recent UK study found that the most common reason for non-referral for surgery in symptomatic patients was a perceived 'high operative risk' and in asymptomatic patients 'no symptoms'.

Among asymptomatic patients, even in a teaching-hospital setting, stress imaging (imaging of the heart valves during mild exercise) was rarely used despite its known prognostic value in helping decide on the best time for intervention.[6]

Older patient age, comorbidities and the presence of poor left ventricular function have all been given as reasons for deferring valve surgery, despite the fact that these need not be contraindications to AVR.[4, 10]

Heart team and HEART VALVE CLINIC expertise – a must for improved management of AS

While guidelines exist to help define AS, it is accepted that there is no uniform definition of valvular disease.[2] The diagnosis of AS and an assessment and stratification of a patient's risk requires sophisticated imaging techniques and tests for blood biomarkers that should be performed and interpreted by VHD experts.[10]

Recognizing this, referral to an expert 'heart team' and to a 'heart valve clinic' (HVC) is now strongly recommended for refined diagnosis and treatment of patients with suspected AS.[10,15] Indeed, to address the shortfalls in capture of AS cases, and to ensure that AS patients who could benefit from the improved clinical outcomes associated with valve repair or replacement are not overlooked for surgery, the ESC has made clear its position and support for HVC-based management of AS.[10]

Effective treatment for more patients

There is strong evidence that as well as saving lives, AVR for severe symptomatic AS improves patient quality of life.[4,14] Recent studies have demonstrated that in asymptomatic severe AS, early surgery improves long-term survival as compared with conventional, non-surgical approaches to patient management,[9] highlighting the need to identify more of these 'silent' cases of AS to allow earlier, potentially life-saving intervention.

Minimally-invasive options

Advances in surgical techniques and the development of state-of-the-art prosthetic valves are revolutionizing AVR and should help see more people with severe AS offered life-changing treatment.[10,16,17]

Each year in Europe, thousands of aortic valve replacement (AVR) operations are undertaken for AS – approximately 100,000 such procedures are performed by conventional cardiac surgery while about 20,000 patients, typically at very high risk elderly patients, are treated by catheter-based interventions.[18] While the advent of transcatheter aortic valve implantation (TAVI) has seen more high risk symptomatic AS patients (i.e. those unsuitable for conventional surgery) being offered AVR, surgical AVR remains the gold standard for the majority of AS patients.[4,19]

One of the most promising advances for patients with AS has been the advent of minimally invasive surgery (MIS) for AVR. As the name suggests, MIS involves operating through a smaller incision (a mini-sternotomy or mini-thoracothomy) than is used in conventional AVR, and is performed in a way that minimizes the surgical impact and operative risks of AVR.[16,17]

MIS - better for patients

Growing evidence suggests that MIS AVR involves a reduction in blood loss, requires fewer blood transfusions, carries less risk of wound infection, reduces pain and can reduce the length of time patients require to stay in cardiac intensive care, as well as cutting the overall length of stay in hospital.[17,20–23]

A development which has allowed MIS AVR to evolve into a well tolerated, efficient surgical treatment option, providing greater patient satisfaction and lower complication rates – and which help reduce surgical time even further – is the invention of 'rapid deployment valves'. These replacement valves do not require complex or lengthy suturing in position. A recent study of one such valve, the EDWARDS INTUITY Valve System, reported that the MIS required for valve placement was associated with reduced aortic cross-clamp and cardiopulmonary bypass times compared with conventional AVR – i.e. the amount of time the heart was "switched off" and without blood supply during surgery was less during MIS.[24]

Surgeons and cardiologists hope that these and other continued advances in AVR will become the way forward and be used in more cases in the future.[23]

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