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Commentary

Measuring Frailty to Determine the Likelihood of Poor Outcomes Following Aortic Valve Replacement: Can the Rockwood Clinical Frailty Scale Prove Useful?

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The importance of frailty as a pre-operative determinant of outcomes following aortic valve replacement has been highlighted in recent years. While particularly frail patients would previously have been deemed unsuitable for traditional Surgical Aortic Valve Replacement (SAVR), the growth of Transcatheter Aortic Valve Implantation (TAVI) as an alternative has thrust this issue into the spotlight. The Valve Academic Research Consortium-2 (VARC-2) document, published in 2013, sets out guidelines for patient selection for TAVI [1]. It recommends the use of an appropriate risk prediction scoring system by the Heart Team (consisting of an interventional cardiologist, cardiac surgeon and imaging specialist as a minimum, with possible inclusion of an anaesthetist or geriatrician as necessary) to estimate 30-day post-procedural mortality risk and determine which patients would be most suitable for TAVI. Furthermore, the scores provide a guide as to which patients may have a degree of futility associated with aortic valve intervention.

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The Society of Thoracic Surgeons (STS) risk score [2] and the European System for Cardiac Operative Risk Evaluation (EuroSCORE) [3] are recommended as predictive risk scores by VARC-2. However, they were developed in a standard surgical risk population and therefore may not be predictive of outcomes in a high risk population, many of whom may now be considered for TAVI. STS and EuroSCORE have been identified as poorly predictive of mortality following TAVI [4,5].

VARC-2 also identified frailty as the "most important patient characteristic not included in current risk models" [1]. Following the growth of national TAVI registries, newer risk scores were developed in an attempt to improve accuracy of risk prediction. Models from France [6], Germany [7], Italy [8] and the US [9] were deemed to have low performance when validated outside their initial derivation cohorts [10]. Subsequent studies have shown that the addition of frailty data may improve the performance of both traditional and contemporary risk scores [11,12].

While frailty is often derived using the 'eyeball test', there is no clear consensus on how best to measure it objectively. Multiple markers of frailty have been studied in relation to TAVI procedures, both unidimensional (e.g. serum albumin, gait speed etc.,) and multidimensional (e.g. essential frailty toolset), with many predicting mortality [13]. A recent systematic review and meta-analysis by Li et al., reported serum albumin as the most common single domain measured, with the Fried/modified Fried phenotype the most common multidimensional scale studied [14]. Given the large variation in reported methods of assessing frailty and their complexity, the need for a standardized frailty measure before aortic valve procedures is highlighted.

The Rockwood Clinical Frailty Scale (CFS) is a clinical judgement-based frailty tool administered after a quick history and physical exam, without the need for further objective measures. This validated scale predicts adverse health outcomes including mortality, functional decline and hospitalization with the advantage of speed and simplicity which may improve feasibility in clinical practice, particularly for clinicians without specialist geriatric training [15]. Our recent systematic review protocol [16], published in BMJ Open earlier this year, details how we aim to examine the evidence surrounding the CFS as a predictor of adverse outcomes following aortic valve replacement. Determining the ability of the CFS to predict outcomes will inform the international evidence-based guidelines on frailty assessment prior to aortic valve replacement.

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