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Mini Review

Frailty Evaluation Impact on TAVR Outcomes: A Mini-Review

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Abstract

This mini review examines the critical role of frailty assessment in improving outcomes for geriatric patients undergoing Transcatheter Aortic Valve Replacement (TAVR). We discuss various frailty assessment tools, highlighting their predictive value for postoperative complications and mortality. The integration of these tools into preoperative evaluations helps identify high-risk patients, enabling targeted interventions to enhance recovery and quality of life after TAVR. This approach is especially relevant given the increasing number of elderly patients undergoing cardiovascular interventions.

Keywords: Transcatheter Aortic Valve Replacement (TAVR), Geriatric Patients, Frailty; Essential Frailty Toolset (EFT), Frailty Index (FI), Hospital Frailty Risk Score (HFRS), Clinical Frailty Scale (CFS), Geriatric Nutritional Risk Index (GNRI)

Abbreviations TAVR: Transcatheter Aortic Valve Replacement; EFT: Essential Frailty Toolset; FI: Frailty Index; HFRS: Hospital Frailty Risk Score; CFS: Clinical Frailty Scale; GNRI: Geriatric Nutritional Risk Index.

Introduction

Transcatheter Aortic Valve Replacement (TAVR) has emerged as a pivotal treatment modality for aortic stenosis, particularly in the elderly. The evaluation of frailty is critical in predicting treatment outcomes and making informed decisions in this demographic. This mini review examines various frailty assessment tools and their correlation with TAVR outcomes.

Materials and Methods

In this mini review, we analyzed recent studies from PubMed using the keywords "frailty," "TAVR," "outcomes," and "geriatrics" to evaluate frailty assessment tools in geriatric TAVR patients. The focus was on understanding how tools like EFT, FI, HFRS, CFS, and GNRI impact postoperative outcomes, highlighting the importance of frailty evaluation in this group.

Results and Discussion

Frailty Scores

Frailty is a complex syndrome marked by diminished resilience and increased vulnerability to stressors. Accurate assessment of frailty in elderly patients undergoing TAVR is crucial for predicting postoperative outcomes.

Essential Frailty Toolset (EFT)

The EFT, which includes a gait speed test (0-2pts), cognitive impairment assessment (0-1pt) hemoglobin (0-1pt) and serum albumin levels (0-1pt) must be ≥3/5 for the patient to be considered frail. A lower EFT score correlates with increased postoperative complications and mortality, especially in TAVR patients. Studies have found an unadjusted Odds Ratio (OR) of 3.29 (95% CI 1.73-6.26) for predicting 30-day mortality, an OR of 3.72 (95% CI: 2.54-5.45) for predicting 1-year mortality, and an OR of up to 3.29 (95% CI 1.73-6.26) for predicting worsening disability post-TAVR [1-4].

Frailty Index (FI)

The FI, based on a comprehensive geriatric assessment, quantifies frailty by the accumulation of health deficits. Research indicates that a higher FI is associated with prolonged hospital

stays and increased mortality post-TAVR. This method of assessing frailty is time-consuming and difficult to apply in daily practice, making it impractical to study. The literature is scarce but lower FI has been associated with a greater risk of poor recovery or death at 6 months post TAVR. Integration of the FI into the phenotypical clinical evaluation improves the discrimination efficiency [5].

Hospital Frailty Risk Score (HFRS)

The HFRS, derived from administrative data, is another validated tool for assessing the frailty risk. It has been shown to predict adverse outcomes, including increased mortality and peri-procedural complications in TAVR patients with reported OR of up to 1.38 (95% CI 1.35-1.42) for 30-days mortality and length of stay >10 days [6]. The correlation between poor HFRS and a higher risk of myocardial infarction, pericardial effusion, pacemaker requirement, severe hemorrhage, and vascular complications have also been documented with an OR of 1.06 to 1.14 after TAVR [7].

Clinical Frailty Scale (CFS)

The CFS is a simple, easy-to-use tool that grades frailty on a scale from 1 (very fit) to 9 (terminally ill). This scale is based on overall fitness and frailty, considering the individual's physical condition and ability to perform daily activities. Studies utilizing CFS have found a significant correlation with other frailty markers such as grip strength assessment and gait speed test and that a higher CFS score is linked to worse outcomes in geriatric patients undergoing TAVR [8].

Geriatric Nutritional Risk Index (GNRI)

The GNRI is a nutritional assessment tool which has been used to evaluate frailty in TAVR patients. Lower GNRI scores are associated with higher morbidity and mortality, underscoring the importance of nutritional status in frailty assessment. It has been described as an independent predictor of mortality with a Hazard Ratio (HR) of up to 3.60 (95% CI 2.30-5.64) [9]. The significant correlation with the gait speed test, grip strength assessment, and CFS has also been documented [9].

Conclusion

Incorporating frailty assessments, such as the EFT, into patient care and combining them with targeted interventions can substantially improve TAVR outcomes in the elderly. This strategy not only identifies high-risk patients but also provides avenues for enhancing their resilience and postoperative recovery. This leads to a clinically and statistically significant improvement in clinical outcomes and quality of life [10]. As the elderly population expands, emphasizing de-frailing strategies will increasingly become crucial in cardiovascular care.

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Conflict of Interest

None.

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