Frailty in Surgical Patients: Is it Relevant to Sexual Medicine?

Ramzy T. Burns MD; Helen L. Bernie DO, MPH

Abstract

Background

As the age of our surgical population continues to rise, there is an increased need for adequate preoperative evaluation and risk stratification to ensure the best possible surgical outcomes for patients.

Aim

We sought to describe the 3 main models currently used to evaluate patient frailty and explore how they are being utilized in the field of surgery and sexual medicine.

Methods

We reviewed online resources including Pubmed with relevant search criteria centered around frailty, surgery, sexual medicine, and prosthetics.

Outcomes/Results

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All relevant studies were reviewed and several models for patient frailty emerged; the Phenotype Model, the Frailty Index, the Clinical Frailty Scale, and the modified Frailty Index. Worse frailty indices were seen to be linked to higher rates of complications and mortalities postoperatively.

Clinical Implications

Although the adoption of patient frailty in the field of sexual medicine has been sluggish, few studies have shown that its use could help predict which patients are at increased risk of complications and may require more support when it comes to postoperative care and teaching.

Strength & Limitations

Overall there is a paucity of literature as it relates to sexual medicine and patient frailty and this paper provides a limited look at the usage of patient frailty in sexual medicine.

Conclusion

We implore all sexual health providers to begin to incorporate frailty metrics when caring for this population to help reduce postoperative complications and help better predict surgical success.

Background

As the age of our surgical population continues to rise, there is an increased need for adequate preoperative evaluation and risk stratification to ensure the best possible surgical outcomes for patients. In the United States today, over 40% of all surgical patients are older than 65 years of age and up to 30% of invasive procedures performed on Medicare beneficiaries occur within the final year of life.[1,2] Advanced age carries a greater risk of postoperative complications, morbidity, and mortality, yet not everyone ages the same. As urologists, we often try to risk stratify patients with tools such as the "eyeball test," "get up and go test," or by having them evaluated in preoperative admission testing. However, these methods are not a reliable and consistent predictor of patient outcomes. More recently, patient frailty has emerged as a tool that better predicts patient mortality and morbidity when compared to chronological age.

Frailty has been defined as an age-related decline in multiple physiological systems which is characterized by a vulnerability to adverse health outcomes and a low reserve for insult.[1] Although there is no standardized model to assess frailty, and several different instruments have been developed, there are three main models in the literature that have arisen to characterize how frailty develops and manifests.

Methods

A literature review was conducted on Pubmed using the search strings patient frailty and surgical outcomes, and patient frailty and sexual medicine. Relevant articles were reviewed and pertinent findings/applications outlined in this paper.

Results

Several models by which patient frailty could be better characterized were seen throughout the literature. The Phenotype model utilizes the features of slow walking speed, weakness as measured by grip strength, self-reported exhaustion/poor energy, unintentional weight loss, and low physical activity.[2] If patients are deemed to have 3 of 5 features, they are deemed frail. In a study of over 5,300 patients aged 65–101 years, Fried et al found that 7% of their cohort were considered frail using the Phenotype Model.[3] They saw that frail patients tended to be older, female, African American, less educated, from a lower socioeconomic class, and had higher rates of comorbidities. There was a 6-fold higher rate of mortality in patients deemed frail vs non-frail when viewing 3-year cumulative survival. Even after adjustment for covariates, the frailty Phenotype model remained independently predictive of falls, worsened mobility, disability, incident hospitalization, and death.

The second model, the Frailty Index (FI), was developed by the Canadian Study of Health and Aging (CSHA) and is a cumulative deficit model.[4] The FI is calculated by totaling the number of deficits present in an individual and dividing by the total number of deficits measured. These deficits include comorbidities, cognitive impairments, geriatric impairments, and psychosocial risk factors. Frailty is then categorized into low, intermediate, and high-risk levels of frailty based on score. The FI score ranges from 0 to 1, with higher scores indicating greater degree of frailty. The deficits incorporated are multifactorial and numerous with up to 70 different deficits. As one can imagine this might be tedious to measure with each patient.

The Clinical Frailty Scale (CFS) was developed in a later stage by the CSHA in an effort to provide a simpler tool for predicting frailty.[4] The CFS is a descriptive scale that ranges from very fit to severely frail and is based on physician judgment. Rockwood et al found that patients with higher scores on the CFS (more frail) were more likely to be older, female, cognitively impaired,

incontinent, and have impaired mobility. The CFS and FI both showed an increasing risk of death and entry into an institutional facility with higher levels of frailty and demonstrated similar areas under the curve in ROC curve analyses, suggesting clinical validity of the CFS.

Lastly, the modified Frailty Index (mFI), consists of variables from the CHSA FI that are readily available in the National Surgical Quality Improvement Program (NSQIP) database.[5] These variables are identifiable patient characteristics which are able to be easily extricated via a simple history-taking and physical examination. The mFI shrunk from 11 to 5 variables with changes in the 2015 NSQIP database and now consists of history of COPD, functional status (defined as partially or totally dependent for activities of daily living), diabetes, history of CHF, and hypertension requiring medication. Subramaniam et al found that the mFI-5 held similar predictive value for mortality, postoperative complications, and unplanned 30-day readmission when compared to mFI-11 across multiple surgical subspecialties.

These models have all been examined to determine their relevance in surgical patient outcomes. Specifically, the mFI-11 was utilized in 16 studies including 683,487 patients, of which 65% were considered frail.[2] This meta-analysis out of the American Journal of Surgery found that frail patients had higher rates of complications, wound complications, readmissions, discharge to skilled care, and mortality across multiple surgical subspecialties. They concluded that patient frailty should be formally incorporated in the preoperative assessment of surgical patients and aid in surgical decision-making.

The implementation of frailty in the field of urology has been sluggish and has most commonly been utilized in urologic oncology. One large analysis by Amin et al tested the utility of mFI-11, mFI-5, and the Risk Analysis Index in patients undergoing 158,855 urologic procedures.[6]

Included procedures were selected based on the most common 20 urologic procedures performed in the NSQIP database. The most common major complications seen included readmission and return to the operating room, and the most common minor complications seen included blood transfusion and urinary tract infection. A FI score >0.27 and a mFI-5 ≥2 both demonstrated increased odds of both major and minor complications, linking frailty to worsened postoperative outcomes following urologic surgeries.

In a single-center study on the use of preoperative frailty assessment in cystectomy patients, 62% of the cohort was considered frail and found to have a 7-fold increased risk of severe complication or death in the first postoperative year.[7] Frailty in this group was assessed using a nutritional assessment based on the Mini Nutritional Assessment, gait speed based on the Timed Get Up and Go Test, polypharmacy evaluation, grip strength, and a daily functioning scale.

There is even more paucity of literature as it relates to frailty in urologic sexual medicine and urologic prosthetics. In a retrospective cohort study of men undergoing artificial urinary sphincter placement or removal, frailty was quantified using the mFI-11 with NSQIP data.[8] Medendorp et al found that a higher mFI-11, but not age, was associated with major complications. With regards to minor complications, mFI-11 was not associated with increased risk, but older age (>85) was seen to be associated. They also found that men undergoing AUS removal procedures were more frail and older compared to men undergoing AUS placement. One single retrospective study utilized the mFI in post-penile prosthesis implantation and found that it was not predictive of adverse outcomes, but did correlate with higher rates of postoperative Clavien-Dindo I–III complications.[9]

In a pilot study of patients undergoing inflatable penile prosthesis placement, Brennan et al analyzed patient grip strength to assess frailty.[10] This group revealed that 77% of patients age 65 and older exhibited frailty, while 54% of patients younger than 65 also exhibited frailty. Frail patients in this group were at increased risk of prolonged recovery with pain and had more challenges with device manipulation/instruction. Notably, frailty did not correlate with increased postoperative complications.

Jointly, NSQIP and the American Geriatric Society proposed a best practice guideline stating that frailty should be formally assessed in the preoperative setting. However, frailty remains an underutilized prognostic indicator despite its ability to identify patients prior to surgery who may be at risk for postoperative complications or may require enhanced postoperative discharge planning and support. Despite this, frailty is an underutilized tool for patient care and surgical planning. Specifically, in the field of urologic sexual medicine, the assessment of patient frailty can improve our ability to risk-stratify patients and improve their postsurgical care.

Conclusion

There are numerous methods to prognosticate patient outcomes prior to surgical intervention. However, frailty is emerging as a better predictor of outcomes than several other previously utilized models. Specifically, there are a few different approaches to assess patient frailty easily in the clinical setting prior to surgical procedures including handgrip strength and the mFI. This knowledge can allow surgeons to better prepare their patients preoperatively and develop appropriate postoperative treatment plans. There remains a lack of utilization of patient frailty in sexual medicine and at a minimum, the application of patient grip strength prior to prosthetic

procedures could significantly improve patient outcomes. We implore all sexual health providers to incorporate frailty metrics when caring for this population.

Statement of Authorship

Ramzy T. Burns and Helen L. Bernie: Conceptualization; Ramzy T. Burns and Helen L. Bernie: Methodology; Ramzy T. Burns and Helen L. Bernie: Writing.

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