Frailty Among Revision Total Knee Arthroplasty Recipients: Epidemiology and Propensity Score-weighted Analysis of Effect on In-hospital Postoperative Outcomes

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Introduction

- There is an increasing rate of rTKA and prevalence of frailty, especially in women and older individuals.
- Frailty has been shown to correlate with worse postoperative outcomes after total knee arthroplasty (TKA).
- However, there remains limited data on the effect of frailty on postoperative outcomes after revision total knee arthroplasty (rTKA), especially regarding in-hospital complications and economic outcomes.

Aims and Objectives

Objective 1: Determine the effect of frailty on in-hospital complication outcomes after rTKA

Objective 2: Determine the effect of frailty on economic outcomes after rTKA.

Analyzed Complications:

- Any complication
- Central Nervous System
- Cardiac
- Deep Vein Thrombosis
- Gastrointestinal
- Genitourinary
- Hematoma/Seroma
- Wound Dehiscence
- Postoperative Infection
- Pulmonary Embolism
- Postoperative Anemia
- Peripheral Vascular Disease
- Respiratory

Analyzed Economic Outcomes:

- Discharge Disposition
- Length of Stay
- Total Charges

Methods

- Discharge data from the National Inpatient Sample was used to identify patients undergoing rTKA from 2006 to the third quarter of 2015.
  - *Primary procedures were excluded from analysis.*
- Patients were stratified into frail and non-frail categories using ICD-9 diagnosis codes.
  - At Least **ONE** of the Following to qualify as frail:
    Pressure Ulcer (707.0X, 707.2X)
    Cachexia (799.4)
    Adult Failure to Thrive (783.7)
    Muscle Weakness (728.87)
    Debility (799.3)
    Difficulty in Walking (719.7)
    History of Fall (V15.88)
    Abnormality of Gait (781.2)
    Anorexia (783.0)
    Abnormal Loss of Weight/Underweight (783.21, 783.22)
    Muscular Wasting and Disuse Atrophy (728.2)
    Senility Without Mention of Psychosis (797)
    Malaise and Fatigue (780.79)
- Propensity score analysis was performed to comparatively analyze in-hospital economic and complication outcomes that occurred before discharge between underweight and normal weight patients.
- All analysis was performed in SAS 9.4 and Stata 13.

Results

- A total of 576,920 patients (17,727 frail) who underwent rTKA were analyzed
- Frail patients were significantly more likely than non-frail patients to experience any complication, deep vein thrombosis, wound dehiscence, respiratory and postoperative anemia complications.
- Frail patients had a significantly longer length of stay and decreased rates of discharge home.
- Frail patients also exhibited increased weighted, total charges, as compared to non-frail patients

	Frail	Non-Frail	OR_{IPTW} (95% CI)	P-Value
Any complications	36.99%	28.83%	1.45 (1.30 - 1.62)	<.0001
Central Nervous System	0.08%	0.08%	1.05 (0.33 - 3.37)	0.9360
Cardiac Complication	0.75%	0.62%	1.21 (0.77 - 1.90)	0.3989
Deep Vein Thrombosis (DVT)	1.12%	0.62%	1.82 (1.21 - 2.74)	0.0044
Gastrointestinal (GI) Complications	0.25%	0.22%	1.14 (0.52 - 2.47)	0.7449
Genitourinary (GU) Complication	0.66%	0.44%	1.49 (0.76 - 2.91)	0.2415
Hematoma/Seroma	1.56%	1.43%	1.09 (0.80 - 1.48)	0.5788
Wound Dehiscence	2.48%	1.30%	1.93 (1.50 - 2.49)	<.0001
Postoperative Infection	0.67%	0.50%	1.35 (0.84 - 2.17)	0.2172
Pulmonary Embolism (PE)	0.56%	0.40%	1.41 (0.85 - 2.35)	0.1799
Postoperative Anemia	32.64%	25.57%	1.41 (1.25 - 1.59)	<.0001
Peripheral Vascular Disease	0.22%	0.13%	1.77 (0.60 - 5.20)	0.2976
Respiratory	0.39%	0.13%	2.93 (1.43 - 5.98)	0.0032
Discharge Home	46.25%	61.88%	0.53 (0.48 - 0.58)	<.0001
Length of Stay (LOS) (days)	6.1 (0.14)	4.6 (0.02)		<.0001
Total Charges (Weighted)	$89,104 (1655.5)	$72,693 (200.3)		<.0001

Table demonstrating propensity weighting outcomes analysis of in-hospital complication and economic outcomes after rTKA stratified by frail and non-frail patient cohorts.

Conclusions

Frailty is significantly associated with increased complications, decreased discharge home, longer length of stay, and increased total charges after rTKA. Care should be taken when performing rTKA in frail patients with special attention directed to improving preoperative optimization and perioperative management for this demographic.

References

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