Journal Club
Division of Geriatric Medicine

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Jones T, Dunn C, Wu Daniel, Cleveland J, Kile D, Robinson TN. *Relationship Between asking an Older Adult about Falls and Surgical Outcomes.* JAMA Surg. Doi:10.1001/jamasurg.2013.2741

I. Background

- More than 1/3 of all inpatient operations in the US are performed in patients 65 and older
- Current pre-operative risk assessments are not adapted to geriatric patients, being organ specific or focusing on chronic disease burden
- Data exists on frailty and surgical outcomes (Robinson TN) but not on individual geriatric syndromes and surgical outcomes.

II. Purpose of the study:

To evaluate the relationship of a history of falls to surgical outcomes in older adults undergoing major elective colorectal and cardiac operations.

III. Study design/methods

- Prospective cohort study in persons age 65 and older who underwent an elective colorectal or cardiac surgery at the Denver VA Medical Center between January 6, 2006 and October 20, 2010. Informed consent was obtained.
- Exclusion criteria: Emergent (< 12 hours of admission) or urgent (12 - 72 hours following admission) operations. In colorectal group: the performance of an additional procedure in combination with the segmental colectomy (ie liver resection and exenteration)
- Patient had a fall history if they had a history of 1 or more falls in the 6 months preceding surgery. Fall defined as "Unintentionally coming to rest on the ground, floor, or other lower level"
- A designated research team collected data prospectively, including the fall history which was taken preoperatively.

IV. Outcomes studied:

A. **30 day postoperative complications (Morbidity)**

As defined by the VA Surgery Quality Improvement Program:

Cardiac (MI, Cardiac Arrest/CPR); Respiratory (PNA, PE, reintubation for resp/cardiac failure); Acute Renal Insuf, Neurologic (CVA/coma > 24 hours) Infection (deep wound or superficial surgical site infection, UTI); Sepsis; DVT; Re-operation

B. **Institutionalization rate**: Discharge to an institutional care facility (not home), if patient was not in one before.

C. **30-day readmission rate**

V. Statistics:

- Bivariate comparisons for the presence or absence of a fall within the 6 months prior to surgery
- Separate analyses were performed for the colorectal and cardiac groups.
- Pre, intra, post operative variables were analyzed using χ^2 tests for categorical variables and nonparametric Wilcoxon rank-sum test for continuous variables
- Bivariable logistic regression was performed to examine the relationship between falls (independent variable) and post-operative complications (dependent variable)
- Multivariable logistic regression was performed to examine history of falls with other establish risk predictors

VI. .Results

Total cohort consisted of 235 subjects (81 colorectal and 154 cardiac);

98% male, mean age of 74 years (SD 6)
78 (33%) patients with history of ≥ 1 falls in the 6 months prior to surgery
65 (28%) had ≥ 1 postoperative complication
5 (2%) postoperative mortality

Baseline characteristics of patients (Colorectal patients: Table 1 page E3; Cardiac patients: Table 2 page E4). Intraoperative variables (operation type, duration, blood loss, transfusion requirements) were no different for fallers/non-fallers for both surgical groups. Disease state was not different within the colorectal groups.

Outcomes studied (Table 3, page E5)

A. **30 day morbidity/Incidence of 1 or more postoperative complications**
Patients who underwent colorectal surgery with a history of ≥ 1 falls in the 6 months prior to surgery had a 7.38 fold odds of developing 1 or more complication postoperatively then patients with 0 falls (P = .003). Cardiac patients: OR 3.095; 95% CI 1.361 – 7.042 P=.007.
Findings were independent of age.

Positive correlation between number of falls and the number of post-op complications **(Figure 2, page E5)** Colorectal group: Spearman rho = 0.411, P < .001; Cardiac group: rho 0.260, P .001

The ability to use fall history to forecast 1 or more postoperative complication was found comparable to Charlson Index but stronger then ASA, age. **(Table 4 page E6)**

B. **Discharge to an institutional care facility** *occurred more frequently in Fallers versus Non-Fallers for both surgeries* **(Table 3, page E5):** Colorectal (n=79): 14 (52%) vs 3(6%) P=.001; Cardiac (n=151): 29 (62%) vs 33 (32%) P=.001

C. **30 day readmission** *was higher in Fallers versus Non-Fallers in both surgeries* **(Table 3, page E5):** Colorectal (n=79): 5(19%) vs. 2(4%) P=.04; Cardiac (n=151): 11(23%) vs. 8(8%) P=.02

VII. Authors conclusions

A. Having fallen in the 6 months prior to an operation was related to the occurrence of 1 or more postoperative complications, independent of advancing age, regardless of what procedure was performed. It was also was associated with the need for discharge institutionalization and 30 day readmission across surgical specialties.
B. Using a history of a geriatric syndrome in preoperative risk assessment for an older adult represents a shift from current preoperative assessment strategies. This study opens the possibility of adding history of falls/other geriatric syndromes into a pre-operative risk calculators such as the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) risk assessment (and database) http://riskcalculator.facs.org/

VIII. Reviewers critique/Limitations

A. Limitations:

1. Male cohort
2. Would have liked to know more about the patients: what % already in LTC, what % with dementia; what about their function.
3. Possible confounders not analyzed – h/o osteoarthritis, joint replacements
4. Study shows efficacy (*the ability to produce a desired or intended result)* and not effectiveness (*the degree to which something is successful in producing a desired result; success*) of preoperative falls at forecasting postoperative outcomes. For example, a research team collecting data about falls may not have the same significance as falls data restrospectively collected out of the nursing notes in an EMR.
5. Outside reviewer stated CVD should have been included in multivariable model
6. Outside reviewer also notes that there may have been other geriatric syndromes more powerful then fall.

B. Summary for practice implications

Does it apply to our practice? Utility?

Perhaps in male, more functional patients in the outpatient setting. I give us more of a figure to cite for risks of post-op complications.

It will be of great interest if the ACS NSQIP risk assessment calculator includes more geriatric applicable, possibly including falls or other geriatric syndromes: http://riskcalculator.facs.org/