



Risk Factors for Delirium in Elderly Fracture Hip Patients - A Retrospective Study

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Introduction

Postoperative delirium (POD) is commonly encountered in elderly patients and is associated with significant morbidity and mortality. The incidence of POD is anywhere from 15% to 53% (depending on the type of surgery), as compared to 1-2% in the general population of similar age group. POD is acute in onset, fluctuating in course along with inattention and disorganized thinking or altered sensorium. It increases the duration of stay in the hospital by 2 to 5 days, and many patients need long term rehabilitation care. The projected increase in Medicare cost is around \$152 billion.

Our aim in this study was to identify the risk factors for POD in patients over 65 years of age coming for fracture hip surgery at Yale New-Haven Hospital. The reported incidence of POD in this patient population is 35 to 65%. In the NSQIP (National Quality Improvement Program) guidelines five risk factors for POD have been identified. The factors are: behavioral and cognitive dysfunction, pre-existing comorbidities, metabolic disturbance, physical impairment, and miscellaneous factors (age, psychotropic medications, urinary catheter etc.).

Methodology

We reviewed the electronic records of 150 patients > 65 years of age who underwent emergent hip fracture surgery in the year 2012 at Yale-New Haven Hospital. The records were obtained from the electronic database. The patient records were reviewed from the time of admission to the time of discharge. Postoperative delirium was identified based on the chart review criteria which relies on identifiable characteristics of delirium in the patients' medical records such as mental status change, inattention, disorientation, agitation, and inappropriate behavior pre- or post-operatively pointing towards the onset of delirium.¹ This technique has a sensitivity of 74% and specificity of 83% (compared to direct interview). The information recorded from the review was divided into three categories: pre-op, intra-op, and post-op for each patient, and the data were later analyzed for identifying the risk factors of POD.

Methodology (contd.)

Preoperative factors such as patient demographics, baseline labs, comorbidities (cardiovascular, respiratory, neurological, metabolic, fluid electrolyte imbalance etc.), pre-existing cognitive dysfunction, delirium with previous surgeries, etc. were noted. Physical disabilities and visual and/or auditory dysfunction also were noted as well as use of psychotropic medications. Relevant intraoperative and postoperative information also was collected from chart review.

Results

Out of 150 patients data from 138 patients was complete and was analyzed. Patients who underwent another major surgery in addition to hip surgery during the same hospital admission were excluded from the study. The incidence of delirium was found to be 51.80% (72/138). Quantitative assessment using the Univariate analysis was done on the data set which was followed by a multivariate logistic regression adjusted for age and pre-existing dementia. Age & pre existing dementia were the only two factors associated with POD.

Table 1(a): Univariate Analysis of Patient Demographics and Anesthesia Type With Post-Op Delirium (Yes/No) as Outcome

| Characteristics | Total (N=138) | Yes (N=72) | No (N=66) | P value |
|--|-----------------|----------------|----------------|---------|
| Age | 84.1 (8.3, 138) | 86.8 (7.5, 72) | 81.3 (8.1, 66) | 0.0002 |
| Living at home Status | | | | 0.1799 |
| Living at Home | 63 (65.6) | 31 (49.2) | 32 (50.8) | |
| Assisted living facility | 33 (34.4) | 21 (83.8) | 12 (36.4) | |
| Baseline Ambulatory Status | | | | 0.2458 |
| Using Assistive/Ambulatory Devices | 35 (47.3) | 20 (57.1) | 15 (42.9) | |
| Independently Ambulating w/o Assistive Devices | 39 (52.7) | 17 (43.6) | 22 (56.4) | |
| Type of Anesthesia | | | | 0.1834 |
| GA | 115 (85.2) | 56 (48.7) | 59 (51.3) | |
| Spinal | 20 (14.8) | 13 (65.0) | 7 (35.0) | |

Conclusion

According to the univariate analysis, age & pre-existing dementia are significantly associated with an increased risk of developing POD. Both factors are independently associated with increased risk of POD.

| Characteristics | Total (N=138) | Yes (N=72) | No (N=66) | P value |
|--------------------------------|-----------------|----------------|----------------|---------|
| Age | 84.1 (8.3, 138) | 86.8 (7.5, 72) | 81.3 (8.1, 66) | 0.0002 |
| Pre-existing Dementia | | | | <.0001 |
| Yes | 37 (27.0) | 31 (83.8) | 6 (16.2) | |
| No | 100 (73.0) | 41 (41.0) | 59 (59.0) | |
| Hypertension | | | | 0.3389 |
| Yes | 94 (68.6) | 52 (55.3) | 42 (44.7) | |
| No | 43 (31.4) | 20 (46.5) | 23 (53.5) | |
| CAD | | | | 0.2895 |
| Yes | 33 (24.1) | 20 (60.6) | 13 (39.4) | |
| No | 104 (75.9) | 52 (50.0) | 52 (50.0) | |
| Both HTN and CAD | | | | 0.4111 |
| Yes | 25 (18.2) | 15 (60.0) | 10 (40.0) | |
| No | 112 (81.8) | 57 (50.9) | 55 (49.1) | |
| History of CVA | | | | 0.1199 |
| Yes | 17 (12.4) | 12 (70.6) | 5 (29.4) | |
| No | 120 (87.6) | 60 (50.0) | 60 (50.0) | |
| Renal Co-Morbidities (CKD/AKI) | | | | 0.5333 |
| Yes | 24 (17.5) | 14 (58.3) | 10 (41.7) | |
| No | 113 (82.5) | 58 (51.3) | 55 (48.7) | |
| Respiratory (COPD/Asthma) | | | | 0.6765 |
| Yes | 23 (16.8) | 13 (56.5) | 10 (43.5) | |
| No | 114 (83.2) | 59 (51.8) | 55 (48.2) | |
| Hypothyroid | | | | 0.1164 |
| Yes | 36 (26.5) | 15 (41.7) | 21 (58.3) | |
| No | 100 (73.5) | 57 (57.0) | 43 (43.0) | |
| Diabetes mellitus (DM) | | | | 0.3352 |
| Yes | 17 (12.7) | 11 (64.7) | 6 (35.3) | |
| No | 117 (87.3) | 61 (52.1) | 56 (47.9) | |

References: S K. Inouye, et al. A Chart-Based Method for Identification of Delirium: Validation Compared with Interviewer Ratings Using the Confusion Assessment Method. JAGS 53:312–318, 2005