Risk factors and progression of subsyndromal delirium in older adults with hip fracture surgery

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WHAT WE LEARNED

We studied the prevalence of subsyndromal delirium (SSD) and its risk factors in 150 older hip fracture patients. We found that 25 patients (16.7%) had preoperative SSD. Near discharge, a third (32%) of these patients' symptoms had resolved, a third (32%) still had SSD, and the rest (36%) progressed towards delirium. Patients with preoperative SSD were more likely to have dementia than patients without preoperative SSD/delirium, but compared to patients with preoperative delirium, were less likely to have had delirium before. Patients who had postoperative SSD had a preoperative cognitive performance that was midway between patients without postoperative SSD/delirium and patients with postoperative delirium.

INTRODUCTION

- Subsyndromal delirium (SSD) is a condition where acute cognitive changes compatible with delirium appear, but the patient's symptoms do not fulfill criteria for a DSM-5-defined delirium.[1]
- Risk factors for SSD are those similar to risk factors for delirium although the difference between patients who develop SSD and fully syndromal delirium may be the severity of their common risk factors.[2]
- Outcomes of SSD are usually intermediate between patients with and without delirium, although it is yet unclear whether there is significant clinical impact.[3]
- Few studies about delirium in hip fracture patients have sought to include patients with SSD or to differentiate between SSD and delirium.
- Evidence about the prevalence, outcomes, and risk factors of SSD in hip fracture patients is slim, and its trajectory is mostly unknown.

OBJECTIVES

- To determine the risk factors of subsyndromal delirium in hip fracture patients, as well as the risk factors for progression towards delirium
- To determine the prevalence of subsyndromal delirium and delirium before and after hip fracture surgery
- To study the course of subsyndromal delirium, namely, its progression towards delirium or resolution

METHODS

Design, setting, and population: Secondary analysis of data from a study involving 150 patients aged 65 and above admitted for hip fracture surgery in a tertiary hospital in Bangkok, Thailand during June 2021 to September 2022. Patients who developed delirium in the preoperative period were excluded from analysis in the postoperative period to reduce confounding from effects of delirium treatment.

Data collection: Electronic medical records and inpatient chart review; bedside medical and psychiatric interview

Statistical analysis:

- Risk factors were compared between 3 groups: patients without SSD/delirium, patients with SSD, and patients with delirium. Pairwise comparisons were also made between patients with SSD and the other groups.
- Chi-square and Fisher's exact test was used to compare categorical data. Continuous data was categorized into groups.
- Crude odds ratio was calculated to determine the significance of preoperative SSD in predicting postoperative delirium. Adjusted odds were also calculated by entering other significant preoperative risk factors into multinomial logistic regression.

Independent variables: Demographic data, comorbidities, and medication use; visual/hearing impairment; dementia; previous delirium; preoperative cognitive performance measured by the Thai Mental State Examination (TMSE)- cut off for dementia ≤23; other perioperative factors

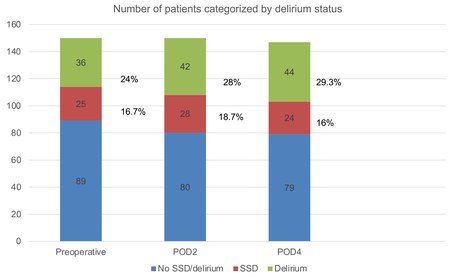
METHODS

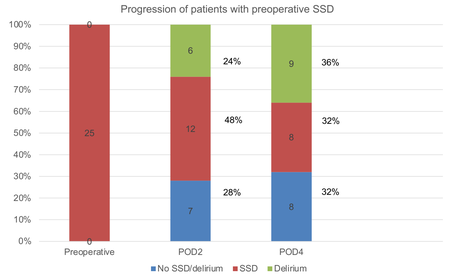
Dependent variable: Assessment of SSD and delirium

- Delirium was assessed using the Thai version of the Delirium Rating Scale-Revised-98 (DRS-R-98)
- A total score of ≥12 was defined as fully syndromal delirium, 7-11 as subsyndromal delirium, and 6 or below was defined as having no delirium.
- Preoperative DRS-R-98 ratings were taken on the day before surgery.
- Postoperative ratings were done one day after the surgery (postoperative day 2; D2), and three days after the surgery (postoperative day 4; D4).
- Postoperative delirium status was defined by the maximal DRS-R-98 score on either day.

RESULTS

Prevalence and progression (N=150)





- SSD patients who progressed towards delirium were more likely to have dementia.
- Crude odds of developing postoperative delirium in patients with preoperative SSD = 3.29 (95% CI 1.20-9.00), odds after adjusting for age and dementia = 1.18, 95% CI 0.32-4.29.

Risk factors, preoperative period (N=150)

Risk factor	No delirium N = 89	Preoperative SSD N = 25	Preoperative delirium N = 36	Significance level
Gender (female)	67 (75.3)	21 (84)	29 (80.6)	0.593
Age	78.37 +-7.65	83.00 +-7.13	85.69 +-5.92	
Age group (80 and above)	44 (49.4)	17 (68)	31 (86.1)	0.001*
Hearing impairment	3 (3.4)	2 (8)	6 (16.7)	0.023* (f)
Previous history of delirium	5 (5.6)	2 (12)	13 (36.1)	<0.001*#
Dementia	2 (2.2)	9 (36)	19 (52.8)	<0.001**
Cognitive impairment on TMSE (≤23)	16 (18)	22 (88)	36 (100)	<0.001**
Benzodiazepines	34 (38.2)	9 (36)	4 (11.1)	0.011*#
Antipsychotics	8 (9)	3 (12)	15 (41.7)	<0.001*

*Significant difference between patients without SSD/delirium and patients with SSD
Significant difference between patients with delirium and patients with SSD

RESULTS

Risk factors, postoperative period (N=114)

Risk factor	No delirium N = 67	Postoperative SSD N = 25	Postoperative delirium N = 22	Significance level
Gender (female)	50 (74.6)	24 (96)	15 (68.2)	0.40
Age	77.48+-7.55	81.36 +-7.54	82.95 +-7.06	
Age group (80 and above)	30 (44.8)	14 (56)	17 (77.3)	0.029*
Dementia	2 (3)	2 (8)	7 (31.8)	<0.001*
Preoperative cognitive impairment on TMSE (≤23)	7 (10.4)	20 (80)	11 (50)	<0.001**#

*Significant difference between patients without SSD/delirium and patients with SSD
Significant difference between patients with delirium and patients with SSD

DISCUSSION

Strengths

- Delirium was assessed at multiple time points of the patients' admission, making us able to follow the progression of symptoms over time.
- Comprehensive data about clinical events in the perioperative period could be collected.

Limitations

- Definition of subsyndromal delirium is variable across studies.
- The number of patients with subsyndromal delirium may have been too small to detect the significance of additional risk factors and consequences.

CONCLUSIONS

- One in six older adults who underwent hip fracture surgery had perioperative SSD.
- The course of SSD may progress or resolve, with cognitive impairment as a risk factor for progression.
- Patients with subsyndromal symptoms of delirium can be a target for preventive interventions to reduce development of postoperative delirium.
- The impact on outcomes are still unclear and may be a topic for future study.

ACKNOWLEDGEMENTS

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