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A STUDY ON RISK OF FALLS IN AGED PATIENTS IN THE POSTOPERATIVE PERIOD IN RURAL WEST BENGAL

General Surgery

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ABSTRACT

Background: Postoperative fall is a small but negligible event which plays a significant role in mortality, morbidity and the recovery of the patient especially the elderly population. The consequences of such falls may result in longer hospital stays, fractures, depression, anxiety, and death. In view of the scarcity of studies about the risk of fall in the postoperative period and its probable relation with surgical recovery, it becomes relevant to assess the risk of falls.

Objective: To estimate the proportion of patients aged 60 years or more experiencing fall during their postoperative period and to find out the risk factors related with it.

Study Design: It is a hospital based Prospective Observational Study done among patients aged 60 years or more who has undergone surgery.

Materials And Method: All patients above 60 years who were admitted in surgical ward, undergoing any surgery, based on inclusion and exclusion criteria. Those patients were evaluated based on 3 instruments: the socio-demographic and clinical questionnaire, the sum of the six MFS (Morse Fall Scale) items that may range from 0 to 125 points and the quality of recovery scale (QoR-40).

Conclusion: The results of this study allowed the identification of risk factors associated with the risk of fall in elderly patients undergoing surgery which is likely to be multifactorial. Thus the findings of this study may support the planning of actions aimed at preventing the risk of fall in the postoperative period.

KEYWORDS

Postoperative Fall, Risk Factors, Elderly

INTRODUCTION

Hospitalized falls are an important source of morbidity and mortality especially during the postoperative period, although a seemingly a simple event, falls represent a complex medical issue resulting in a common cause of non-fatal hospital acquired injuries. The definition of fall, according to the American Geriatrics Society, "an unexpected displacement of the body to a lower level than the initial position without loss of consciousness"[1]. Falls rob older individuals of their quality of life by reducing mobility and independence. This occurs because of physical injury as well as psychological factors that preclude an individual from reaching their existing potential in the requirements of activities for daily living (ADL's). The hospital stay of individuals who fall may be extended for 12.3 more days on average, and the occurrence of such incidents may increase hospital costs by up to 61%[2]. Although falls are not necessarily indicators of a poor health condition, their consequences may predispose individuals to serious consequences[3]. Therefore, despite the impossibility of completely avoiding the risk of falls, the importance of reducing this risk should be considered, especially through a multidisciplinary assessment of the patient[4]. Many falls in the elderly are probably multifactorial, resulting from the convergence of several intrinsic, pharmacologic, environmental, behavioral, and activity-related factors. It is also important to assess not only the risk of falls that these individuals are exposed, but also the quality of the physical recovery of the individual submitted to the surgical procedure, which consequently may represent a risk factor for fall.

OBJECTIVE

To estimate the proportion of patients aged 60 years or more sustaining fall on the ground during their postoperative period and to find out the factors influencing such postoperative fall among the study subjects.

Study Design

A hospital based Prospective Observational Study was conducted in a rural based tertiary care hospital and medical college of elderly patients of either sex aged 60 years or more admitted in surgery ward who had undergone surgery based on inclusion and exclusion criteria. The sample size for the proposed study was calculated based on the formula used for incidence study. The formula is: $n = (Z/E)^2$ Where Z=1.96(two tailed at 95% confidence interval) E=error around the reported incidence of the event of interest (post-operative) Assuming 15% error the sample size would be 171. Now considering 10% refusal/drop rate the sample size would be 188. As per record there are 2-3 aged patients per week operated at the center, the data collection for the study was of one year i.e.52 weeks. As the number of cases seemed to be less than the estimated sample size, consecutive cases were included as per selection criteria.

MATERIALS AND METHODS

Study was done in Department of General Surgery, Bankura Sammilani Medical College & Hospital, Bankura, within a span of 18 months. Permission from Institutional Ethics Committee and informed consent from the study subjects obtained. All patients above 60 years who were admitted in surgical ward, Department of General Surgery, Bankura Sammilani Medical College & Hospital, Bankura undergoing any surgery, based on inclusion and exclusion criteria. Based on the socio-demographic and clinical questionnaire, the sum of the six MFS items that may range from 0 to 125 points. Scores between zero and 24 represent low risk of fall during hospitalization, requiring basic nursing care. Scores between 25 and 44 points represent moderate risk of fall and therefore require the implementation of basic interventions to prevent possible falls. Patients classified with 45 points and over have a high risk of fall, that is, they need planned and implemented actions in order to prevent falls and The maximum score for QoR-40 is 200 (excellent quality of recovery), and the minimum score is 40 (poor quality of recovery). The statistical analysis was done using standard statistical software and the p-value ≤ 0.05 was considered for statistically significant.

Inclusion Criteria-

All patients above 60 years who have been hospitalized at the surgical units; have undergone surgical procedure for treatment; have cognitive ability to participate, assessed by means of the mini mental state examination were included in the study.

Exclusion Criteria-

1. Orthopaedic surgeries 2. Patients in late postoperative period (>30days) 3. Nonsurgical patients

Statistical Analysis

For statistical analysis data were entered into a Microsoft excel spreadsheet and then analyzed by SPSS (version 27.0; SPSS Inc., Chicago, IL, USA) and Graph Pad Prism version 5. Data had been summarized as mean and standard deviation for numerical variables and count and percentages for categorical variables. Two sample t-tests for a difference in mean involved independent samples or unpaired samples. Paired t-tests were a form of blocking and had greater power than unpaired tests. A chi-squared test ($\chi 2$ test) was any statistical hypothesis test wherein the sampling distribution of the test statistic is a chi-squared distribution when the null 29 hypothesis is true. Without other qualification, 'chi-squared test' often is used as short for Pearson's

chi-squared test. Unpaired proportions were compared by Chi-square test or Fischer's exact test, as appropriate. Z-test (Standard Normal Deviate) was used to test the significant difference of proportions. Explicit expressions that can be used to carry out various t-tests are given below. In each case, the formula for a test statistic that either exactly follows or closely approximates a t-distribution under the null hypothesis is given. Also, the appropriate degrees of freedom are given in each case. Each of these statistics can be used to carry out either a one-tailed test or a two-tailed test. Once a t value is determined, a p-value can be found using a table of values from Student's t-distribution. If the calculated p-value is below the threshold chosen for statistical significance (usually the 0.10, the 0.05, or 0.01 level), then the null hypothesis is rejected in favour of the alternative hypothesis. p-value ≤ 0.05 was considered for statistically significant.

RESULTS AND ANALYSIS

Table 1: Distribution Of Different Risk Factors And Its Significance

RISK FACTORS	PERCENTAGE (%)	Z VALUE	P VALUE
AGE 60-70 YEARS 71-80 YEARS 81-90 YEARS	 79.3 19.1 1.6	11.6565	< 0.00001
SEX FEMALE MALE	 43.6 56.4	2.4754	0.01314
MARITAL STATUS MARRIED UNMARRIED	 95.2 4.8	17.5342	< 0.00001
PURPOSE OF SURGERY CURATIVE DIAGNOSTIC PALLIATIVE	 88.3 5.3 6.4	15.9064	< 0.00001
SURGERY SIZE LARGE MEDIUM SMALL	 33.5 47.3 19.1	2.7323	0.00634
DIABETES MELLITUS NO YES	 71.3 28.7	8.2514	<0.00001
SYSTEMIC ARTERIAL HYPERTENSION NO YES	 62.2 37.8	4.7445	<0.00001
ANEMIA NO YES	 76.1 23.9	10.1079	<0.00001
POSTOPERATIVE PAIN NO YES	 30.3 69.7	7.943	<0.00001
CANCER NO YES	 74.5 25.5	9.4891	<0.00001
POSTURAL HYPOTENSION NO YES	 88.8 11.2	15.0588	<0.00001
DIZZINESS NO YES	 89.9 10.1	15.4713	<0.00001
BOWEL/BLADDER INCONTINENCE NO YES	 92.6 7.4	16.5027	<0.00001
IMPAIRED BALANCE NO YES	 88.8 11.2	15.0588	<0.00001
LACK OF SLEEP NO YES	 89.4 10.6	15.265	<0.00001
MUSCLE WEAKNESS NO YES	 54.3 45.7	1.6503	0.09894
NARCOTICS/OPIOIDS USE NO YES	 56.9 43.1	2.6817	0.00736
ANTI-HYPERTENSIVES NO YES	 64.4 35.6	5.5697	<0.00001
ANXIOLYTIC AGENTS NO YES	 95.2 04.8	17.5342	<0.00001
DEPRESSION NO YES	 96.3 03.7	17.9467	< 0.00001
ANXIETY NO YES	 95.2 04.8	17.5342	<0.00001
SEVERE OBESITY NO YES	 98.4 01.6	18.7719	<0.00001
PRIOR H/O FALL NO YES	 97.9 02.1	18.5656	< 0.00001
USE OF WHEEL CHAIR/ ASSISTIVE DEVICES NO YES	 98.9 01.1	18.9782	<0.00001

Table 2: Distribution Of Mean AGE

	Number	Mean	SD	Minimum	Maximum	Median
AGE	188	66.8989	5.0606	60.0000	85.0000	66.0000

In above table showed that the mean age (mean± s.d.) of patients was 66.8989± 5.0606.

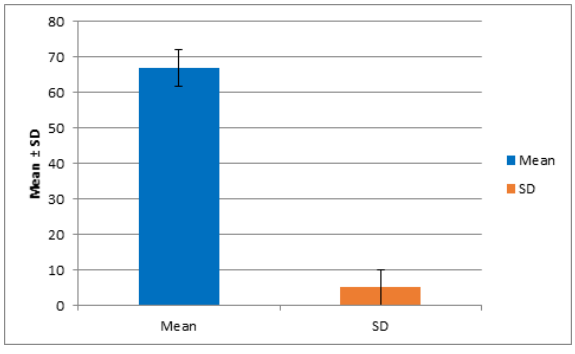


Table 3: Distribution Of Mean Morse Fall Scale

	Number	Mean	SD	Minimum	Maximum	Median
Morse fall scale	188	31.0904	15.7098	0.0000	80.0000	35.0000

In above table showed that the mean Morse fall scale (mean± s.d.) of patients was 31.0904± 15.7098.

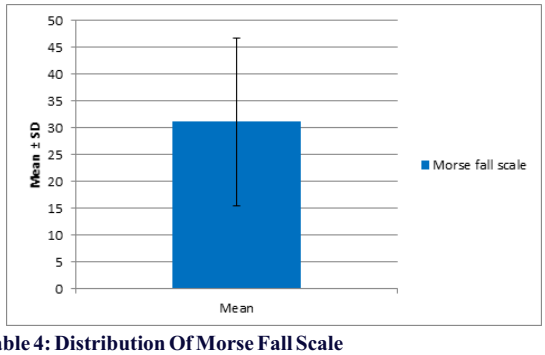


Table 4: Distribution Of Morse Fall Scale

MORSE FALL SCALE Groups	Frequency	Percent
Low Risk	48	25.5%
Moderate Risk	73	38.8%
High Risk	67	35.6%
Total	188	100.0%

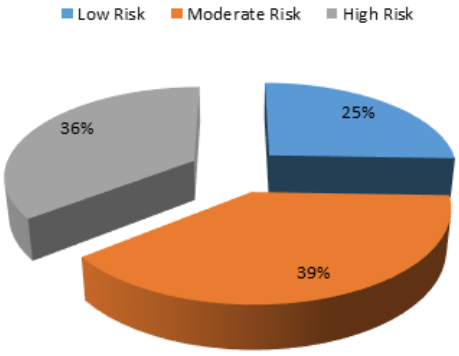
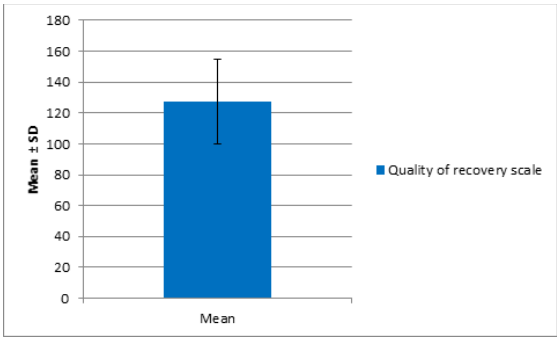


Table 5: Distribution Of Mean Qualtity Of Recovery Scale

	Number	Mean	SD	Minimum	Maximum	Median
Quality of recovery scale	188	127.1436	27.2886	48.0000	186.0000	123.0000

In above table showed that the mean Quality of recovery scale (mean± s.d.) of patients was 127.1436± 27.2886.



DISCUSSION

One of the greatest concerns for the elderly population, especially those who is undergoing surgery is the possibility of falls. Falls and their resulting injuries have a significant impact on the physical, mental and social health of patients. Falls in the elderly are probably multifactorial, resulting from the convergence of several intrinsic, pharmacologic, environmental, behavioral, and activity-related factors. In our study the mean age of patients was 66.8989± 5.0606. Our study showed that 149(79.3%) patients were 60-70 years old, 36(19.1%) patients were 71-80 years old and 3(1.6%) patients were 81-90 years old. **Gazibara T et al [5] (2017)** found that falling represents a major public health problem among older persons because it leads to premature mortality, loss of independence, and placement in assisted-living facilities. In our study 82(43.6%) patients were Female and 106(56.4%) patients were Male. The value of z is 2.4754. **Nurmi I et al [6] (2002)** found that women fell on their hips or buttocks more often than men did ($p < 0.01$) suggesting gender has a role to play in postoperative fall. In our study 179(95.2%) patients were married and 9(4.8%) patients were Unmarried. **Severo IM et al [7] (2018)** found that absence of caregiver [OR 0.37 (0.22 to 0.63), p<0.001] was one of the risk factors for falls in hospitalized patients. In our study it was found that 166(88.3%) patients had Purpose of surgery C(curative), 10(5.3%) patients had Purpose of surgery D(diagnostic) and 12(6.4%) patients had Purpose of surgery P(palliative). And 63(33.5%) patients had Large Surgery size, 89(47.3%) patients had Medium Surgery size and 36(19.1%) patients had Small Surgery size.

In our study we found that, 54(28.7%) patients had diabetes mellitus. **Mata LR et al [8] (2017)** found that diabetes (p=0.017) was positively associated with high risk of fall.In our study 71(37.8%) patients had hypertension. **Mata LR et al [8] (2017)** found that SAH (p<0.001) was positively associated with high risk of fall. **Chu JJ et al [9](2015)** showed that factors including blood pressure and anti-hypertensive medication application were reported as hazards of fall.In our study 45(23.9%) patients had anemia. In our study 131(69.7%) patients had post-operative pain. **Stubbs B et al [10](2014)** found that the odds of falling were significantly higher in those with pain (n=4674; OR=1.71; 95% CI, 1.48–1.98; I2=0%).In our study 48(25.5%) patients had cancer. **Mata LR et al [8] (2017) (2017)** found that cancer (p=0.004) was positively associated with moderate risk of fall. **Fahimnia S et al [11] (2018)** found that falls are prevalent among older patients with cancer. **Wildes TM et al [12](2015)** found that older adults with cancer may be at greater risk for falls and have unique risk factors. In our study 21(11.2%) patients had postural hypotension. 19(10.1%) patients had dizziness. 21(11.2%) patients had impaired balance. And 20(10.6%) patients had lack of sleep. **Luzia MD et al [13] (2014)** found that neurological alterations was one of the prevalent risk factors for fall. **Pi HY et al [14] (2016)** found that postural hypotension was one of the risk factors for fall related fractures. In our study 14(7.4%) patients had bowel/bladder incontinence. **Severo IM et al [7] (2018)** found that frequent urination [OR 4.50 (1.86 to 10.87), p=0.001] was one of the risk factors for falls in hospitalized patients.

Our study showed that 86(45.7%) patients had muscle weakness. The association of muscle weakness with postoperative fall was not statistically significant (The value of p is .09894).

In our study 81(43.1%) patients had narcotics/opioids. 67(35.6%) patients had anti-hypertensive. 9(4.8%) patients had Anxiolytic agents. **Chu JJ et al [9](2015)** showed that factors including blood pressure and anti-hypertensive medication application were reported as hazards of fall. **Vitor AF et al [15](2015)** showed that the risk factors the use of narcotics and/or opiates and use of antihypertensive medication increased the risk of fall. **Costa-Dias MJ et al [16](2014)** found that patients who received drugs from the therapy group of "Central Nervous System", are 10 times more likely to have fall risk (OR 9. 90, 95% CI 1.6–60.63). Our study showed that 7(3.7%) patients had depression. 9(4.8%) patients had anxiety. 3(1.6%) patients had severe obesity. 4(2.1%) patients had prior h/o fall. 2(1.1%) patients had use of wheel chair/assistive devices. **Vitor AF et al [15](2015)** showed that the previous history of falls was one of the risk factors for fall. **Fahimnia S et al [11] (2018)** found that patients with use of canes had one-time or multiple falls. **Kronzer VL et al [17] (2016)** showed that falls are common after surgery, and preoperative falls herald postoperative falls and other adverse outcomes. **Severo IM et al [7] (2018)** found that walking limitation [OR 4.34 (2.05 to 9.14), p<0.001] was one of the risk factors for falls in hospitalized patients.

In our study the mean Morse fall scale of patients was 31.0904± 15.7098, that is moderate risk of fall with 25.5% of the patients presenting a low risk of fall, 38.8% moderate risk and 35.6% high risk. **Mata LR et al [8] (2017)** found that 35.4% of patients had high risk of falls, 38.9% had moderate risk and 25.7% had low risk. As for the surgical recovery, we found that the mean Quality of recovery scale of patients was 127.1436± 27.2886 and none of the patients showed a poor quality of surgical recovery. **Mata LR et al [8] (2017)** found that the mean value in the surgical recovery scale was 175.37 points and no patient presented poor surgical recovery. **Myles PS et al [18](2000)** found that the QoR-40 is a good objective measure of quality of recovery after surgery.

Given the diversity of risk factors for fall in the postoperative period, the early identification of these factors by the health profession is imperative in order to propose preventive and effective actions that suppress or minimize such risks.

CONCLUSION

From our study we conclude that 1.59% elderly patients had experienced fall during the postoperative period.

Certain factors like Age, sex, marital status, purpose of surgery, size of surgery, diabetes mellitus, hypertension, anemia, postoperative pain, cancer, postural hypotension, dizziness, impaired balance, lack of sleep, bowel/bladder incontinence, certain drugs like narcotics/opioids, anti-hypertensives, anxiolytics, disorders like depression and anxiety, severe obesity, prior history of fall and use of wheel chair/assistive devices are associated with risk for falls in postoperative elderly patients which reinforces the fall as a multifactorial event. Thus recognizing factors related to postoperative falls will aid the practicing surgeon by identifying patients most likely to fall in the postoperative setting and will provide focus for the design of postoperative fall prevention programs.

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