

ORIGINAL ARTICLE

EFFECT OF A SPECIAL ORTHOPEDIC TRAUMA ROOM ON THE MORBIDITY OF PATIENTS OVER A ONE MONTH PERIOD

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ABSTRACT:

Background: Hip fractures are a relatively common occurrence in the elderly population and pose a substantial financial burden on the health care system. Hip fractures are usually given a higher priority than other orthopaedic surgical conditions, with a target time to surgery within 48 hours of admission. In spite of all such provisions and utmost care, patients still suffer due to higher incidence of trauma as such among Indian population. The impact of a special orthopaedic trauma room on the morbidity of such patients has been previously supported by many. However, it's the impact in an Indian scenario has still not been assessed. **Methods:** Trauma patients admitted in the last 3 years were identified through the trauma register, representing the 2 years before and 1 year after the opening of the orthopedic trauma room. Type of fracture, mode of fixation, age, sex, Length of stay (LOS), American Society of Anesthesiologists (ASA) score, time to operating room (OR), and one month mortality was documented. **Results:** The study included 350 patients (207 pre- and 143 post-trauma room opening). Mean LOS decreased from 12.6 to 8.5 days ($p = 0.02$) and there was a decrease in mean time to OR from 37.4 to 23.9 hours ($p = 0.006$). However, no difference was found in the 30-day mortality rate ($p = 0.46$). The LOS decreased by an average of 4 days following opening of the special trauma room. **Conclusion:** The special orthopaedic trauma room significantly decreased the LOS and wait times to surgery. Further analysis would be needed to assess the cost-effectiveness and the long-term outcome of this patient population.

Key words: Hip fracture, orthopaedic trauma.

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INTRODUCTION

Hip fractures occur commonly in the elderly population and create a considerable monetary burden on the health care system. Low-energy mechanical falls seem the most common mechanism, and the underlying cause in the vast majority of cases is usually osteoporosis¹. The occurrence of hip fractures increases exponentially subsequent to the age of 50 years², approximately doubling after every 5 years³. One-year mortality is around 12%–37%⁴, and it is seen that 4%–12% of patients will die during their initial admission.⁴ Approximately 5.6% patients do experience a second hip fracture in their lifetime⁵.

The average length of stay (LOS) in hospital after a hip fracture is approximately 21 days^{3, 4}. With such an increase in the aging patient population and with inadequate and declining resources, hospitals need to find more efficient ways of providing high-quality health care to patients with hip fractures. The aim of this study was to assess the impact of a special orthopedic surgical trauma room on length of stay, wait time to surgery and 30-day mortality for patients admitted with hip fractures.

METHODS

After achieving ethical approval from the reviewer board, A list was made of patients admitted to the hospital with a diagnosis of hip fracture between August 1, 2011, and July 30, 2014, were selected from the trauma register, representing the cases that appeared in the period 2 years prior to and 1 year after the opening of the special orthopaedic trauma room. Orthopaedic surgeons executed surgical fixation procedures based on the call timetable.

Patient charts were reviewed and data collected in relation to the type of fracture, mode of fixation, age, sex, American Society of Anesthesiologists (ASA) score, time from admission to fixation, LOS and 30-day mortality. Mortality was recorded through follow-up records and by contacting patients and families.

Patients for whom no diagnosis was available, those who died before surgical fixation, those who underwent non-operative management, those who had open fractures or additional fractures/injuries and those who required trauma team activation were excluded.

RESULTS

A total of 350 patients were included in the study: 207 women and 143 men. The mean age at the time of diagnosis was 69.5 ± 10.4 (range 37–92) years, the mean time from admission to operative fixation was 28 ± 2.6 hours, the median LOS was 9.7 days. Half of the patients (54.3%) were diagnosed with ASA classification of 3, and 22.5% had an ASA classification of 4. The most frequent modes of surgical fixation were bipolar hemiarthroplasties (26.8%), cephalomedullary nails (22%) and dynamic hip screw constructs (19.8%). No association was found in relation to LOS, duration of surgery, time to OR when compared to sex or operative side, but the patients admitted after the opening of the special trauma room were found to have shorter LOS than patients admitted prior (p = 0.02). Time to OR was longer for admissions occurring before the special trauma room was opened (p = 0.006) LOS, duration of surgery, time to OR). No significant differences were found in the mortality rates among the two groups. (Table 1)

Table 1: Comparison of key factors pre- and post-trauma room opening

Characteristic	Pre – trauma room (n = 207)	Post – Trauma Room (n = 143)	p-value
Age	70.2 ± 1.2	69.4 ± 2.3	0.23
ASA classification	3.3 ± 0.2	3.6 ± 0.4	0.56
Death	18	14	0.46
Time to Operative room	37.4	23.9	0.006
Duration of surgery	64.3 ± 2.3	68.2 ± 4.2	0.32
Length of Stay	12.6	8.5	0.02

DISCUSSION

The result of this study indicates that the introduction of a special orthopaedic trauma room decreased the time to surgery and LOS. However, in conditions of resource limitations, it is imperative to assess the effectiveness of the decisions objectively.

Hip fractures are linked with lengthy hospital stays; they have a considerable impact on the functional status of patients and carry high mortality. These fracture surgeries were usually carried out within 24–48 hours once the patient was deemed medically stable. However, the completion of these cases competed with other urgent cases, both orthopaedic and non-orthopaedic.

It was seen that after controlling for appropriate variables, LOS reduced by approximately 2 days. Such a significant decrease of 2–4 days can prove to be economically substantial. Moreover, time to OR also decreased with an average decrease of 6.9 h.

No significant differences were found in the 30-day mortality (p=0.46). This observation is in accordance with other studies carried out in North American and European countries.⁶ Also, the indifference in the

mortality rate after the opening of a special orthopaedic trauma room suggests that patients were not harmed by earlier discharges.

The mean time from admission to OR was 27.6 hours, which is comparable to other studies⁷. In some cases, time to OR was delayed like for patients requiring preoperative optimization (dialysis, echocardiograms, stabilization in the intensive care unit)⁷. The LOS in the present study is below published standards^{3,5}, and majority of the patients went home or to rehabilitation facilities within 12 days. This would assist the complex issue of postoperative patient disposition and the continuous lack of long term extended bed care. In this scenario where there is an increase in aging and ailing population and diminishing resources, this is an area of care that all hospitals must pursue aggressively.

CONCLUSION

Hip fractures continue to be a major focus in trauma associated with orthopedic surgery. They are usually associated with high mortality and decreased independence and are among the most expensive fractures to treat when patient, hospital and societal costs are taken into account. The addition of a special orthopaedic trauma room shows a positive impact on length of stay as well as time to surgery without any negative effects on mortality. Such time and resource allocation strategies will continue to be significant ingredients of health care deliverance all over the world.

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