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Demographic analysis of profile of neurosurgical patients at tertiary care medical school in Eastern India: An institutional experience

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***Abstract*---**Background: Since becoming a distinct field of medicine, neurosurgery now admits some of the most frequent patients to the intensive care unit. The study's goal was to examine the characteristics of neurosurgical patients admitted to a level III mixed, medical-surgical intensive care unit in a tertiary hospital in Eastern India in order to determine the reasons for these patients' admissions, as well as their outcomes in terms of length of stay in the unit and mortality. Methods: An investigation was carried out in IMS and SUM Hospital, Bhubaneshwar following ethical approval from the institute's Institutional Review Committee. The study covered all patients with neurosurgical issues admitted to the ICU for the 12-month period from January 2021 to December 2021. Results: During the one-year study period, a total of 659 neurosurgical patients were admitted in the ICU. Among them 445 (67.53%) were males and 214 (32.47%) were females. Age wise distribution showed patients aged between 18 and 60 years to be the most common at 476 (72.23%). Sixty (9.10%) patients aged below 18 years, while 123 (18.66%) were aged more than 60 years. It showed that maximum patients had trauma 150(22.76%). The mean duration of hospital stay among trauma patients was 32.6 ± 12.6 days and non-trauma patients was 34.4 ± 11.4 days. The mortality among trauma patients and non-trauma patients was 11% and 14% respectively. Conclusions: The mortality

and morbidity rates for patients undergoing neurosurgical procedures are high, notwithstanding recent improvements in care.

***Keywords*---**Demographic Profile, Intensive care unit, Mortality, Neurosurgery, Outcome.

Introduction

According to the Lancet Commission on Global Surgery, an additional 143 million surgical procedures must be performed each year to satisfy global surgical demand[1]. Today, with 15 to 20 great centres of excellence, it is a subject of justifiable pride that no Indian needs to travel abroad for any form of neurosurgical management. Deep brain stimulation (DBS), robotic radiosurgery, robots for telestroke care, the capacity to perform the most complex multidisciplinary skull base surgery, the ability to preserve hearing in acoustic schwannomas, the use of neuroendoscopy, and intraoperative magnetic resonance imaging are all available to us (MRI). These cutting-edge facilities, nevertheless, are hard to come by. The majority of India's 1800 neurosurgeons reside in metropolitan areas, leaving 800 million Indians in suburban and rural areas with very little direct access to even primary general neurosurgery. With a population of 9 million, Chennai (Madras) has 110 neurosurgeons, which is also the same number of neurosurgeons serving North Eastern India's 250 million people[2].

Most critically ill hospital patients are admitted to the intensive care unit (ICU), and neurocritical care is crucial in managing patients with predominantly neurological diseases, whether treated surgically or conservatively[3]. Any neurosurgical intervention's effectiveness depends not only on the surgical technique but also on the multidisciplinary team's participation and input, as well as appropriate postoperative critical care[4]. Regarding the types and results of neurosurgical patients in ICU, there is a dearth of information from India. In order to apply techniques that would assist reduce the mortality and morbidity of neurosurgical patients in ICU and enhance overall result, this study was done with this purpose in mind.

Methods

An investigation was carried out in IMS and SUM Hospital, Bhubaneshwar following ethical approval from the institute's Institutional Review Committee. The study covered all patients with neurosurgical issues admitted to the ICU for the 12-month period from January 2021 to December 2021. The information was gathered by looking through patient files, computerised medical records, and the ICU admission discharge book. Age, sex, diagnosis, pre- or postoperative state, length of stay in the intensive care unit, and outcome (survivor, non-survivor) were the variables examined. The information was entered into Microsoft Excel and then examined with SPSS.

Results

During the one-year study period, a total of 659 neurosurgical patients were admitted in the ICU. Among them 445 (67.53%) were males and 214 (32.47%) were females. Age wise distribution showed patients aged between 18 and 60 years to be the most common at 476 (72.23%). Sixty (9.10%) patients aged below 18 years, while 123 (18.66%) were aged more than 60 years (table 1). Table 2 showed the types of Neurosurgical patients according to diagnosis in ICU. It showed that maximum patients had trauma 182 (27.62%).
Table 3 showed the Mortality and mean duration of hospital stay among patients with trauma and non-trauma. It showed that mean duration of hospital stay among trauma patients was 32.6 ± 12.6 days and non-trauma patients was 34.4 ± 11.4 days. The mortality among trauma patients and non-trauma patients was 11% and 14% respectively.

Table 1: Distribution of patients according to age and gender

Variable (n=659)	N	%
Gender		
Male	445	67.53
Female	214	32.47
Age (in years)		
<18	60	9.10
18-60	476	72.23
> 60	123	18.66

Table 2: Types of Neurosurgical patients according to diagnosis in ICU

Types (n=659)	N	%
ICH	87	13.20
HYDROCEPHALUS	23	3.49
SOL	118	17.91
PIVD	127	19.27
TRAUMA	182	27.62
CYST	12	1.82
ABSCESS	11	1.67
NEURAL TUBE DEFECTS	9	1.37
TUMORS	30	4.55
OTHERS	134	6.83
INFARCT	6	0.91
ANEURSYM	9	1.37

Table 3: Mortality and mean duration of hospital stay among patients with trauma and non-trauma

Variables	Trauma (n=150)	Non-trauma (n=509)
Mean duration of hospital stay(days)	32.6 ± 12.6	34.4 ± 11.4
Mortality (%)	11	14

Discussion

Worldwide, neurosurgical critical care has developed into a distinct specialisation, but in the developing world, this idea is still in its infancy. The units that provide complete medical and specialised neurological support for patients with life-threatening neurological illnesses have evolved from neurosurgery units that treat postoperative cases in this field. To provide the best care for these complicated critical patients, neurocritical care requires tight coordination and partnership between critical care, neurology, and neurosurgery. The use of resources and hospital mortality have decreased as a result of the neurointensivists' expanding role in these neurocritical care units[5,6].

Similar to other studies by Roka et al. and other ICU in low resource countries, the male and female admission distribution in our study was for postoperative treatment, encompassing emergency and elective procedures [7,8] When comparing ICU patients from Tunisia (n=430) and France (n=534), Nouira et al. found that the French ICU performed better overall since its mortality was lower and its patients were younger.[9]

This study just compared a profile of neurosurgery patients to previous studies and did not include many factors to do so. But compared to numerous other studies from Nepal, Nigeria, and Singapore, the result and duration of stay of these neurosurgical patients in this ICU are comparable [7,9,10].

This study is analogous to another study from Austria on severe head injuries, where the fatality rate was 31.7%, which likewise demonstrated that there were no statistically significant relationships between injury mechanisms and trauma severity or ICU outcomes[11,12].

Conclusion

The results of neurosurgery are comparable to those in other affluent nations, and India has very few ICUs that care for neurosurgery patients. Therefore, it is now necessary to create Neurocritical Care as a separate speciality along with advancements in the creation of Neurosurgical subspecialties.

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