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Original Research Article

Spectrum of neurosurgical operative interventions at the regional centre for neurosurgery UDUTH Sokoto: a 5 years review

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ABSTRACT

Background: Neurosurgical operative interventions are aimed for the diagnosis and treatment of diseases of the central and peripheral nervous systems. The spectrum of these interventions ranges from cranial, spinal and peripheral interventions, and could also be elective or emergency based on the urgency of the intervention. Data on the spectrum of neurosurgical operative interventions are limited in our environment. The aim of the study is to describe the epidemiological profile, diagnoses and pattern of neurosurgical operative interventions at our center.
Methods: This is a retrospective study analyzing the demographic profile, clinical diagnoses and operative interventions of neurosurgical patients managed at our center over a period of 5 years, from January 2014 to December 2018.
Results: A total of 784 patients had operative interventions during the study period. Five hundred and twenty (520) patients were males representing 66.3%; paediatric patients accounted for 487 patients (62.1%). Majority of the patients (518 patients: 66.1%) had elective interventions. The commonest indication for neurosurgical intervention during the study period was Neurotrauma (235 patients: 30%), followed by hydrocephalus (218 patients: 27.8%) and then neurooncology (137 patients: 17.5%). Ventriculoperitoneal shunt (218 patients: 27.8%), excision and repair of myelomeningocoele (107 patients: 13.6%) and debridement/elevation for open head injury/ elevation of depressed skull fracture (85 patients: 10.8%) were the commonest operative interventions during study period.
Conclusions: Although Ventriculoperitoneal shunt and excision and repair of myelomeningocoele were the commonest operative neurosurgical intervention during the study period, neurotrauma cases constituted the commonest indications for operative surgical intervention.

Keywords: Hydrocephalus, Myelomeningocele, Neurotrauma, Neurooncology, Ventriculoperitoneal shunt

INTRODUCTION

Neurosurgical diseases most especially neurotrauma are associated with significant morbidity and mortality in young populations worldwide.[1-4] Management of neurosurgical cases entails non-operative and operative surgical interventions. Based on the location of the neurosurgical pathology, these operative neurosurgical interventions can be grouped into cranial, spinal or peripheral interventions. They could also be grouped as emergency or elective based on the urgency of such intervention. Elective surgery is defined as surgical procedure that is scheduled in advance and not immediately life threatening and may be planned within weeks or months. Emergency surgery is defined as surgical procedure that should be performed as soon as possible, ideally within 24 hours, and which may be lifesaving.[5]

Data on the pattern of neurosurgical diseases and the spectrum of neurosurgical interventions in our

environment is limited; therefore, this study aims to describe the demographic profile, diagnoses as well as the spectrum of the neurosurgical interventions in our center.

METHODS

This is retrospective descriptive study of all neurosurgical patients who had neurosurgical operative intervention at the regional centre for neurosurgery, Usmanu Danfodio university teaching hospital Sokoto over a period of 5 years, from January 2014 to December 2018.

Ethical approval was sought and obtained from the Hospital's ethical committee.

The inclusion criteria are all neurosurgical patients of all age and gender who had operative intervention over the period of the study.

Patient's demographics profile (Sex and age), clinical characteristics (Diagnosis, location of the pathology and urgency of the intervention), and the type of neurosurgical operative intervention were obtained from the theatre operative records.

The data collection was done using a semi structured questionnaire and Microsoft excel, and then exported to SPSS, version 25.0 (IBM Corp, Armonk, NY) for the analysis.

The results are presented in simple frequency tables and percentages.

RESULTS

A total of 784 patients had neurosurgical operative intervention at the regional center for neurosurgery Usmanu Danfodio university teaching hospital Sokoto over a period of 5years, from January 2014 to December 2018.

Gender distribution

Males were predominant, 66.3% (n=520) were males and 33.7% (n=264) were female, with M: F of 1.9: 1.

Age distribution

Paediatric patients (those aged 16 years and below) were the majority, accounted for 487 patients (62.1%). Adult patients were 297 representing 37.9%.

Pathological distribution based on site

Six hundred and seven (607) patients representing 77.4% had cranial pathologies, 149 patients (19%) had spinal pathologies, and 28 patients representing 3.6% had combined cranial and spinal pathologies.

None had intervention for peripheral nerve pathology.

Spectrum of diagnosis

Neurotrauma cases were the commonest indication for operative intervention, accounted for 235 patients (30%), followed by hydrocephalus with 218 patients (26.6%) and neurooncology with 137 patients (17.5%).

In paediatric patients, hydrocephalus (36.6%), myelomeningocoel (22%) and neurotrauma (11.5%) were the most commonest indications for surgical intervention. However, in adult patients, neurotrauma (59.6%), neuroonlogy (25.9%) and degenerative spine diseases (4.1) were the commonest.

Pattern of surgical intervention based on urgency

Five hundred and eighteen (518) patients had elective interventions, while 266 patients representing 33.9% had emergency operative interventions. This put our emergency to elective ratio at 0.51: 1.

Spectrum of neurosurgical operative interventions

Ventriculoperitoneal shunt is the commonest intervention in our center during the study period accounting for 218 patients (27.8%), followed by excision and repair of myelomeningocole 107 patients (13.6%), and debridement or elevation of open or depressed skull fractures.

Others include double burr hole drainage of CSDH (64 patients: 8.4%), craniotomy or craniectomy for tumour excision (61 patients: 7.9%), craniotomy and evacuation of hematoma (43 patients: 5.5%), laminectomy or ACDF (42 patients: 5.4%), combined VP shunt and excision and repair of myelomeningocele (36 patients: 4.6%).

Table 1: Demographic profile.

Variables	N (%)
Gender	
Male	520 (66.3)
Female	264 (33.7)
Age (In years)	
≤16	487 (62.1)
>16	297 (37.9)
Total	784 (100)

Table 2: Distribution of the pathologies based on the site.

Site of pathology	N (%)
Cranial	607 (77.4)
Spinal	149 (19)
Cranial + spinal	28 (3.6)
Peripheral	0 (0)
Total	784 (100)

Table 3: Pattern of diagnoses among paediatric patients.

Diagnosis	N (%)
Head injury	56 (11.5)
Brain tumour	55 (11.3)
Brain abscess/ subdural and epidural empyema	10 (2.1)
Hydrocephalus	178 (36.6)
Scalp / skull lesions	14 (2.9)
Encephalocoele	36 (7.4)
Myelomeningocel	107 (22)
Chiari II malformation	28 (5.6)
Spinal trauma	2 (0.4)
Spinal tumour	1 (0.2)
Total	487 (100)

Table 4: Pattern of diagnoses among adult patients.

Diagnosis	N (%)
Head injury	154 (51.9)
Brain tumour	77 (25.9)
Brain abscess/ subdural/ epidural empyema	11 (3.7)
Scalp/ skull lesions	10 (3.4)
Normal pressure hydrocephalus	6 (2)
Spinal trauma	23 (7.7)
Degenerative disc diseases	12 (4.1)
Spinal tumour	4 (1.3)
Total	297 (100)

Table 5: Spectrum of neurosurgical operative interventions.

Operative interventions	N (%)
Ventriculoperitoneal shunt	218 (27.8)
Excision and repair of myelomeningocele	107 (13.6)
Debridement/elevation of depressed/open skull injury	85 (10.8)
Burrhole drainage of CSDH	64 (8.2)
Craniotomy/ craniectomy and tumour excision	61 (7.9)
Craniotomy for hematoma	43 (5.5)
Laminectomy/ ACDF	42 (5.4)
Excision of encephalocele	36 (4.6)
Combined VP shunt and excision and repair of myelomeningocele	28 (3.6)
Excision of scalp/skull lesions	24 (3.1)
Excision/drainage of brain abscesses/subdural/epidural empyema	21 (2.6)
Burrhole biopsy for tumour	16 (2)
Insertion of ommaya reservoir	12 (1.5)
Craniotomy for CSF leak	11 (1.4)
Transphenoidal resection of pituitary adenoma	9 (1.1)
EVD	7 (0.9)
Total	784 (100)

DISCUSSION

Operative interventions are the major treatment modalities in the management of neurosurgical diseases. This study aimed at describing the spectrum of neurosurgical operative interventions in our environment.

The demographic profile, diagnoses and type of operative intervention for 784 patients had operative intervention from January 2014 to December 2018 at our centre were assessed.

Majority of our patients were males, accounting for 520 patients (66.3%). This is similar to the findings by Udoh et al, and Devkota et al at university of Benin teaching hospital Benin, Nigeria, and Karnali academy of health sciences, Karnali Nepal respectively.[6,7] It is also similar to the findings by Abebe et al at Tikur Anbessa university hospital and Myungsung Christain medical center Addis Ababa, Ethiopia.[8] However, Saeedi et al in their study at King Abdulaziz university hospital Jeddah, Kingdom of Saudi Arabia founds female preponderance among patients who had neurosurgical operative interventions.[9]

Paediatric patients were the predominant group from our study, 487 patients were below the age of 16 years. This collaborates the finding by Udoh et al in Benin, Nigeria.

Neurotrauma is the commonest indication for operative intervention, followed hydrocephalus by in our study. This correlates with the findings in sub-Saharan Africa by Udoh et al and Abebe et al and Benin Nigeria and Addis Ababa Ethiopia respectively, where Neurotrauma were the commonest indication for neurosurgical operative intervention.[7,8] Also Devkota et al in a study in Nepal ,neurotrauma is the commonest indication.[6] However, Saeedi et al in their study in Saudi Arabia, neurooncology was the commonest indication for operative interventions.[9]

The predominant neurosurgical operative intervention during our study period was ventriculoperitoneal shunt, followed by excision and repair of myelomeningocel and elevation and debridement of open/depressed skull fracture. Our finding differs from the finding by Abebe et al at Addis Ababa Ethiopia, where the most predominant operative interventions were burr hole drainage of CSDH, ventriculoperitoneal shunt and elevation and debridement of open/depressed skull fracture.[8]

Some of the limitations of our study include being a retrospective single centered study and inability to include the outcomes of the operative interventions.

CONCLUSION

The spectrum of operative interventions in our center correlates with pattern from other studies in low-medium income countries. Although ventriculoperitoneal shunt is commonest surgical intervention in our study,

neurotrauma cases remains commonest indications for neurosurgical operative intervention in our environment.

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Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Akang EE, Kuti MO, Osunkoya AO, Komolafe EO, Malomo AO, Shokunbi MT et al. Pattern of fatal head injuries in Ibadan-a 10-year review. Med Sci Law. 2002;42(2):160-6.
2. Andriessen TM, Horn J, Franschman G. Epidemiology, severity classification, and outcome of moderate and severe traumatic brain injury: a prospective multicenter study. J Neurotrauma 2011;28(10):2019-31.
3. Bullinger M, Azouvi P, Brooks N, Basso A, Christensen AL, Gobiet W et al. Quality of life in patients with traumatic brain injury-basic issues, assessment and recommendations. Restor Neurol Neurosci 2002;20:(3-4)111-24.
4. Silva. D, Mary J. Patient outcome after traumatic brain injury in high-, middle-and low-income countries: analysis of data on 8927 patients in 46 countries. Int J Epidemiol. 2009;38(2):452-8.
5. Prin M, Guglielminotti J, Mtalimanja O, Li G, Charles A. Emergency-to-Elective Surgery Ratio: A Global Indicator of Access to Surgical Care. World J Surg. 2018;42:1971-80.
6. Devkota H, Khadka NK, Rokaya PK, Giri PK. Spectrum of Diseases among Neurosurgical Patients in a Tertiary Care Hospital of Nepal: A Descriptive Cross-sectional Study. J Nepal Med Assoc 2021;59(234):176-9.
7. Udoh DO, Akpede GA, Obeta EC, Osazuwa U, Tudjegbe S, Akpodoado D. Neurosurgical operative interventions in a new neurosurgical centre in resource-limited settings: A hospital-based study in Nigeria. Arch Int Surg. 2018;8(4).
8. Abebe M, Munie T, Lende G, Bekele A. Pattern of Neurosurgical procedures in Ethiopia: Experience from Two Major Neurosurgical Centres in Addis Ababa. E Centr Afr J Surg. 2011;16(1):1-8.
9. Saeedi R, Bajunaid K, Sabbagh AJ, Alomar S, Alyousef M, Baeesa SS. Pattern of neurosurgical practice at a university hospital in KSA during COVID-19 pandemic. J Taibah University Med Sci. 2021;17(3):448-53.

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