International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-70, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Cranial Surgeries in a New Neurosurgery Centre in an Urban Specialist Hospital in Southeast Nigeria: A 40-Month Review

Dr. Kaunda Ibebuike
Department of Surgery, Division of Neurosurgery, Imo State University Teaching Hospital, Orlu, Imo State

ABSTRACT
Background: The Imo State Specialist Hospital (IMSSH) commenced neurosurgical services in April 2021 with outpatient consultations, and a cranial surgery performed in the same month was her first neurosurgical procedure. This is an audit of cranial pathologies surgically managed in the hospital in her first 3 years since the commencement of neurosurgical procedures.
Aims: The study aimed to look at the pattern of cranial pathologies surgically managed in the hospital from the commencement of neurosurgery services, including their age and gender distribution, the cranial pathologies and their distribution.
Methods: The surgical records of all neurosurgery patients who had cranial surgical operations at IMSSH, Owerri, from April 2021 to July 2024 (40 months) were retrospectively reviewed.
Results: One hundred and ninety-two (192) patients had cranial surgical operations during the study period (an average of 5 surgeries per month). The mean age of patients was 39 years with a male-to-female ratio of 1.5:1. The mean age for male patients was 43 years while that of female patients was 32 years. The peak age range at presentation was in the paediatric age group, 0 – 19 years (n=69, 36%), followed by the elderly age group, 60 – 79 years (n=55, 28.6%). The highest frequency of cranial surgeries was performed for hydrocephalus (n=85, 44.3%). This was followed by cranial haematomas (n=52, 27.1%), cranial tumours (n=33, 17.2%) and cranial infections (n=13, 6.8%). Among cases of hydrocephalus, hydrocephalus in children (n=46) accounted for the highest number of cranial surgeries, while among cranial haematomas and cranial tumours, chronic subdural haematoma (n=27, 59.1%) and meningiomas (n=13, 39.3%) accounted for the highest frequencies respectively.
Conclusion: The study showed a male preponderance for cranial pathologies surgically managed in the hospital, with hydrocephalus in children and chronic subdural haematoma in the elderly having the highest presentation in our environment. A focus on preventive measures against hydrocephalus and chronic subdural haematoma may help in reducing the burden of these diseases in our environment.

KEY WORDS: cranial surgery, new neurosurgery centre, southeast Nigeria, urban.

Abbreviations: IMSSH, Imo State Specialist Hospital; M, Male; F, Female; MMC, Myelomeningocele; NPH, Normal Pressure Hydrocephalus; ASDH, Acute Subdural Haematoma; Subacute SDH, Subacute Subdural Haematoma; CSDH, Chronic Subdural Haematoma; AEDH, Acute Extradural Haematoma; ICH, Intracerebral Haematoma

INTRODUCTION

The Imo State Specialist Hospital, Owerri, South-East Nigeria, is a tertiary health facility established on 22nd January 2018, and provides medical services, teaching and research in the field of medicine and related areas. Owerri is the largest city in Imo State, and serves as the capital of Imo State with an estimated population of 560,700 as of 2022 while the population of Imo State is estimated at 5.4 million as of 2022.[1,2] IMSSH is a public hospital and serves Imo State, nearby neighbouring States including Rivers, Abia, Anambra; and beyond.

Neurosurgical services started with outpatient consultations in April 2021 and later the first neurosurgery procedure, a case of ventriculoperitoneal shunt insertion in an infant, was performed in the same month. We review the demographics of the cranial surgeries performed at the hospital in the first 40 months since commencement of neurosurgery services.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-70, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

MATERIALS AND METHODS

This was a retrospective data-based study of all cranial pathologies operatively managed at the Imo State Specialist Hospital, Owerri, Nigeria over a period of 40 months.

Ethical clearance was obtained from the Ethics Committee of the Imo State Specialist Hospital to carry out the research.

Medical records of patients operated on for cranial pathologies from April 2021 to July 2024 were retrieved and data collected using a structured proforma.

The data obtained was analyzed by the use of computer aided statistical analysis of the variables. Simple statistical calculations such as mean, frequency and percentages of variables were worked out.

RESULTS

During the 40 months study period, 192 patients had cranial surgeries, giving an average of 5 cranial surgeries per month. The patient's characteristics is as shown in table 1.

Table 1: Summary of Patient Characteristics

Variables	Frequency
Total number of patients	192
Male	115 (59.9%)
Female	77 (40.1%)
M: F	1.5:1
Mean age (years)	39
Mean age for males (years)	43
Mean age for females (years)	32
Peak age range	0-19 (n=69, 36.0%)

The mean age of patients was 39 years with a male-to-female ratio of 1.5:1. The mean age for male patients was 43 years while that of female patients was 32 years. The peak age range at presentation was in the paediatric age group, 0 – 19 years (n=69, 36%), followed by the elderly age group, 60 – 79 years (n=55, 28.6%). The highest frequency of cranial surgeries was performed for hydrocephalus (n=85, 44.3%). This was followed by cranial haematoma (n=52, 27.1%), cranial tumours (n=33, 17.2%) and cranial infection (n=13, 6.8%). Among cases of hydrocephalus, hydrocephalus in children (n=46) accounted for the highest number of cranial surgeries, while among cranial haematomas and cranial tumours, chronic subdural haematoma (n=27) and meningiomas (n=13) accounted for the highest frequencies respectively.

The mean age of the patients that underwent cranial surgery during the study period was 39 years with a male to female ratio of 1.5:1. The mean age for male patients was 43 years while that of female patients was 32 years. The peak age range at presentation was in the paediatric age group, 0 – 19 years (n=69, 36%) (Table 2). This was followed by the elderly age group, 60 – 79 years (n=55, 28.6%). The highest frequency of cranial surgeries was performed for hydrocephalus (n=85, 44.3%) followed by cranial haematomas (n=52, 27.1%), cranial tumours (n=33, 17.2%) and cranial infections (n=13, 6.8%) (Table 3). Among cases of hydrocephalus, congenital hydrocephalus and other causes of hydrocephalus beside Normal Pressure Hydrocephalus (NPH) accounted for the highest frequency (n=58), followed by NPH (n=21) while hydrocephalus with Myelomeningocele accounted for only 6 cranial surgeries (Table 5). Chronic subdural haematoma (CSDH) accounted for the highest cranial surgeries among cranial haematomas (n=27) followed by acute extradural haematoma (AEDH) (n=8), subacute subdural haematoma (subacute SDH) (n=7) and intracerebral haematoma (ICH) (n=6). The least was acute subdural haematoma (ASDH) (n=4) (Table 5). Intracranial meningiomas (all histologically confirmed) accounted for the highest cranial surgeries among cranial tumours (n=13) followed by posterior fossa tumours (n=5) (Table 5). Other cranial pathologies include cranial infections, encephalocele, decompressive craniectomy, arachnoid cyst and aneurysm (Table 5).

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-70, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Table 2: Age of patients at presentation

Gender/Age group	0-19	20-39	40-59	60-79	80-99	Total	Percent%
Male	35	17	23	34	6	**115**	59.9
Female	34	6	12	21	4	**77**	40.1
Total	**69**	**23**	**35**	**55**	**10**	**192**	100
Percent%	36	12	18.2	28.6	5.2	100	

Table 3: Gender Distribution of Patients according to Cranial Pathology

Cranial Pathology /Gender	Male	Female	Total	Percent%
Hydrocephalus	46	39	**85**	44.3
Haematoma	39	13	**52**	27.1
Tumour	14	19	**33**	17.2
Cranial Infection	12	1	**13**	6.8
Encephalocele	2	3	**5**	2.6
Decompressive Craniectomy	1	1	**2**	1.0
Arachnoid Cyst	1	-	**1**	0.5
Aneurysm	-	1	**1**	0.5
Total	**115**	**77**	**192**	**100**
Percent%	**59.9**	**40.1**	**100**	

Table 4: Age Distribution of Patients According to Gender and Cranial Pathology

Age Group	0-19		20-39		40-59		60-79		80-99		Total	Percent%
Cranial Pathology/Gender	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**		
Hydrocephalus	20	26	3	-	4	4	15	6	4	3	**85**	44.3
Haematoma	3	1	6	3	12	1	16	7	2	1	**52**	27.1
Tumour	4	4	4	2	3	5	3	8	-	-	**33**	17.2
Cranial Infection	6	-	2	-	4	1	-	-	-	-	**13**	6.8
Encephalocele	1	3	1	-	-	-	-	-	-	-	**5**	2.6
Aneurysm	-	-	-	-	-	1	-	-	-	-	**1**	0.5
Arachnoid Cyst	1	-	-	-	-	-	-	-	-	-	**1**	0.5
Decompressive Craniectomy	-	-	1	1	-	-	-	-	-	-	**2**	1.0
Total	**35**	**34**	**17**	**6**	**23**	**12**	**34**	**21**	**6**	**4**	**192**	100

Table 5: Age Distribution of Patients According to Gender and Specific Cranial Pathology

Age Group		0-19		20-39		40-59		60-79		80-99		Total (%)
Cranial Pathology/Gender		**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	
Hydrocephalus		**20**	**26**	**3**	**-**	**4**	**4**	**15**	**6**	**4**	**3**	**85**
	Hydrocephalus	16	24	3	-	3	3	7	1	-	1	58 (68.2)
	NPH	-	-	-	-	1	1	8	5	4	2	21 (24.7)
	Hydrocephalus + MMC	4	2	-	-	-	-	-	-	-	-	6 (7.1)
Haematoma		**3**	**1**	**6**	**3**	**12**	**1**	**16**	**7**	**2**	**1**	**52**
	CSDH	-	1	3	-	5	-	10	5	2	1	27 (51.9)
	AEDH	3	-	1	-	1	1	2	-	-	-	8 (15.4)

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-70, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

	Subacute SDH	-	-	-	1	4	-	2	-	-	-	7 (13.5)
	ICH	-	-	1	1	1	-	1	2	-	-	6 (11.5)
	ASDH	-	-	1	1	1	-	1	-	-	-	4 (7.7)
Tumour		**4**	**4**	**4**	**2**	**3**	**5**	**3**	**8**	**-**	**-**	**33**
	Meningioma	1	-	3	2	2	2	1	2	-	-	13 (39.3)
	Posterior fossa tumour	2	1	1	-	-	-	1	-	-	-	5 (15.1)
	Glioma	-	-	-	-	1	-	1	1	-	-	9 (9.1)
	Metastasis	-	-	-	-	-	1	-	2	-	-	3 (9.1)
	Pituitary Adenoma	-	-	-	-	-	1	1	-	-	-	2 (6.1)
	Craniopharyngioma	1	1	-	-	-	-	-	-	-	-	2 (6.1)
	Pineal Region	-	2	-	-	-	-	-	-	-	-	2 (6.1)
	Scalp Tumour	-	-	-	-	-	1	-	1	-	-	2 (6.1)
	Acoustic Neuroma	-	-	-	-	-	-	-	1	-	-	1 (3.0)

DISCUSSION

Starting a neurosurgery service is capital intensive with regards to acquiring neurosurgery instruments and equipment. This situation is worse in resource poor environments categorized as low and middle income countries (LMIC). This was the situation at Imo State, Nigeria, until 2015 when funds were released by the Imo State Government, first to construct a neurosurgery theatre at the Imo State University Teaching Hospital, Orlu, and later for the purchase of neurosurgery instruments and equipment. While some of these instruments and equipment were purchased from local surgical retailers within Nigeria, others were purchased from online oversea retailers, and foreign companies that manufacture surgery equipment. The same scenario was later utilized in commencing neurosurgery services at the Imo State Specialist Hospital, Owerri, in 2021. Opara et al[3] in an earlier publication highlighted factors to be considered to commence spine surgeries. This may be adopted for both spine and cranial surgeries as part of neurosurgery services. Udoh[4] in his study on establishing new neurosurgical facilities in resource-limited settings concluded that a functioning neurosurgical unit may be established in resource poor environments to meet the needs of the environment even with minimal available resources.

The findings in the study at the Imo State Specialist Hospital, Owerri, show that there were more males (n=115, 59.9%) than females (n=77, 40.1%) with a male to female ratio of 1.5:1. This is similar to the findings by Udoh et al[5] in Benin City, Nigeria; Lasseini et al[6] in Sokoto, Nigeria and Adebe et al[7] in Addis Ababa, Ethiopia, who also had a male preponderance in their studies. The highest frequency of cranial surgeries in IMSSH was in the paediatric age group 0 – 19 years (n=69, 36%), and this is similar to the findings by Udoh et al[5] in Benin City, Nigeria. However, whereas the highest frequency of cranial surgeries at IMSSH was performed for hydrocephalus (treated by ventriculoperitoneal shunt insertion in IMSSH) (n=85, 44.3%) followed by cranial haematomas (n=52, 27.1%), Udoh et al[5] in Benin City (n=330, 28%) and Lasseini et al[6] in Sokoto (n=235, 30%) had cranial trauma related pathologies as the most common indication for cranial surgery in their studies, followed by hydrocephalus (n=187, 16% in Benin City and n=218, 26.6% in Sokoto). Adebe et al[7] in Addis Ababa, Ethiopia, had neurotrauma as the most common operative diagnosis (n=294, 21.6%) followed by hydrocephalus (n=222, 16.3%). The contrast in the study findings at IMSSH, Owerri, from other studies may reflect a reducing trend in neurotrauma in our urban environment due to the ban on commercial motorcycles in the urban city of Owerri since 2011.[2,8] Road traffic accidents in Nigeria was reported to have reduced with the ban of commercial motorcycle riders.[8] An interesting observation in the study by Lasseini et al[6] in Sokoto is that although neurotrauma was the most common indication for operative intervention, ventriculoperitoneal shunt (VPS), for the treatment of hydrocephalus, was the most common intervention in their center during their study period. This is similar to the findings in IMSSH, Owerri, as VPS insertion for hydrocephalus was the most common indication for cranial surgery during our study period. Also the highest frequency for surgeries for hydrocephalus was performed in the paediatric age group, 0 – 19 years, in IMSSH (n=46) and this is similar to the findings by Udoh et al[5] where congenital hydrocephalus (n=137) accounted for most operations in the paediatric age group in their study. Lasseini et al[6] also had hydrocephalus (36.6%) as the most common indication for surgical intervention in the paediatric age group. Gandaho et al[9] in Cotonou, Benin, also reported hydrocephalus as the most usually observed pathologies in children's population in their study which

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-70, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

included operative military neurosurgical campaigns. The above findings are not surprising as congenital hydrocephalus remains a common pathology in the paediatric age group in neurosurgery services.

Cranial haematomas were the most common indication for surgeries in middle age group, 40 – 59 years, (n=13) and elderly age group, 60 – 79 years, (n=23) in the study at IMSSH, and this is similar to the findings in the study by Udoh et al[5] where operations for chronic subdural haematoma (CSDH) were performed mostly in the elderly (88 of 171, i.e. 51.5%). In our study at IMSSH, CSDH accounted for the highest cranial surgeries among cranial haematomas (n=27) followed by acute extradural haematoma (AEDH) (n=8), subacute subdural haematoma (subacute SDH) (n=7) and intracerebral haematoma (ICH) (n=6). The least was acute subdural haematoma (ASDH) (n=4). Lasseini et al[6] had similar findings with CSDH (n=64, 8.4%) having highest indication for haematoma evacuation in their study. The lower frequency of AEDH and ASDH in our study at IMSSH may reflect the reducing trend in neurotrauma in our urban environment.

Among intracranial neoplasms, intracranial meningiomas accounted for the highest cranial surgeries among cranial tumours (n=13) followed by posterior fossa tumours. The high frequency of meningiomas relative to other cranial tumours in our study (39.3%) compares with studies by Idowu et al[10] in Ibadan, Nigeria (35%), Idowu and Apemiye[11] in Lagos, Nigeria (30%) and Ibebuike et al[12] in Johannesburg, South Africa (31.8%) which all reported meningioma as the most common intracranial neoplasm in their studies. However, the total number (33) of intracranial tumours over 40 months in our study is very low when compared to the total number in the study by Ibebuike et al[12] in Johannesburg (151), which was over 12 months. This may reflect the low level of health services utilization in our environment where most patients pay directly for their healthcare needs (a few patients have National Health Insurance which, however, does not cover the entire surgery charges) in our public hospitals with most patients unable to afford the charges for their surgery, unlike in Johannesburg where health services were offered free in the public hospitals.

CONCLUSION

The study showed a male preponderance for cranial pathologies surgically managed in the hospital, with hydrocephalus as the most common indication for cranial consultation and cranial surgeries in our urban environment. The study findings reveal that cranial pathologies are not rare in our urban environment, hence there is need to improve access to neurosurgery care in our resource poor setting by encouraging more enrollment into the National Health Insurance scheme to reduce the financial burden of care on patients and their relatives.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

REFERENCES

1. "Imo (State, Nigeria) – Population Statistics, Charts, Maps and Location" www.citypopulation.de. Retrieved 2024-10-27.
2. Ibebuike K. A Comparative Review of Spine Surgeries in Two New Neurosurgery Centres in an Urban and Rural Environment in Southeast Nigeria. International Journal of Current Science Research and Review 2024;7(11), 8468-8472, DOI: https://doi.org/10.47191/ijcsrr/V7-i11-34
3. Opara OO, Onuwa MU and Ibebuike KE (2024). Patterns of Spine Cases in a new Neurosurgery Centre in Southeast Nigeria. Journal of Surgery & Anesthesia Research. SRC/JSAR-210. DOI: doi.org/10.47363/JSAR/2024(5)183
4. Udoh DO. Establishing new neurosurgical facilities in resource-limited settings: Overcoming challenges in West Africa. African Journal of Neurological Sciences 2013;32:68-76
5. 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;8:159-65.
6. Lasseini A, Koko AM, Isa AB, Ladan A, Ladan H, Abdullateef A. Spectrum of neurosurgical operative interventions at the regional centre for neurosurgery UDUTH Sokoto: a 5 years review. Int Surg J 2023;10:1881-4
7. 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;16:1-8.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 12 December 2024
DOI: 10.47191/ijcsrr/V7-i12-70, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

8. Muhammad DG. The ban of commercial motorcycle riders: an effective strategy in reducing the rate of road traffic accidents in Nigeria. Yen Med J. 2020;2:5 – 6
9. Gandaho HJ, Soumaila M, Hoinsou-Hans I, Djrolo GM, Zevounou AA, Adeleye AO. Main neurosurgical pathologies in Benin Republic. J Neurosci Rural Pract 2016;7:S52-6.
10. Idowu O, Akang EEU, Malomo A. Symptomatic Primary Intracranial neoplasms in Nigeria, West Africa. JNS Turkish 2007;24:212-218.
11. Idowu OE, Apemiye RA. Delay in presentationand diagnosis of adult primary intracranial neoplasms in a tropical teaching hospital: A pilotstudy. IJS 2009;7:396-398.
12. Ibebuike K, Ouma J, Gopal R. Meningiomas among intracranial neoplasms in Johannesburg, South Africa: prevalence, clinical observations and review of the literature. African Health Sciences 2013; 13(1): 118 – 121

Cite this Article: Ibebuike K. (2024). Cranial Surgeries in a New Neurosurgery Centre in an Urban Specialist Hospital in Southeast Nigeria: A 40-Month Review. International Journal of Current Science Research and Review, 7(12), 9278-9283, DOI: https://doi.org/10.47191/ijcsrr/V7-i12-70