



A 3 Year Review of Spine Surgeries in a New Neurosurgery Centre in an Urban Specialist Health Facility in Southeast Nigeria

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ABSTRACT

Background: The Imo State Specialist Hospital (IMSSH) commenced neurosurgical services in April 2021 and spine procedures in August 2021. This is an audit of spine pathologies surgically managed in the hospital in her first 3 years since spine surgeries were commenced.

Aims: The study aims to look at the pattern of spinal pathologies surgically managed in the hospital from the commencement of spine services, including their age and sex distribution, the pathologies and their spinal distribution.

Methods: Neurosurgery operating room records were utilized to retrieve the case files of all spine patients who had surgical operations at IMSSH from August 2021 to July 2024 (36 months), and these were retrospectively reviewed.

Results: One hundred and fifty-seven (157) spine patients had surgical operations during the study period (an average of 4 spine surgeries per month). The mean age of patients was 54 ± 16.03 years with a male-to-female ratio of 1.7:1. The mean age for male patients was 53 ± 17.18 years while that of female patients was 55 ± 14.05 years. The peak age range at presentation was in the elderly age group, 60 – 79 years ($n=68$, 43.3%), followed by the middle age group, 40 – 59 years ($n=58$, 36.9%). The highest frequency of spine surgeries was performed in the lumbar ($n=43$, 27.3%), lumbosacral ($n=42$, 26.8%) and cervical spines ($n=42$, 26.8%) almost in equal proportion. This was followed by thoracolumbar junction ($n=13$, 8.3%) and thoracic spine ($n=8$, 5.1%), while cervicothoracic junction, sacral and lumbosacropelvic accounted for 1.9% ($n=3$) each. Degenerative spine diseases (71.9%) accounted for the highest number of spine surgeries, followed by spinal trauma (19.7%) and spinal tumours (3.9%).

Conclusion: The study showed a male preponderance for spinal pathologies surgically managed in the hospital, and most of the pathologies were due to degenerative spine diseases. It also highlights the fact that spine pathologies are not rare in our environment, and more doctors should be encouraged to become spine surgeons to help in tackling these pathologies in our environment.

KEY WORDS: spine surgery, urban, new neurosurgery Center, Nigeria

INTRODUCTION

The Imo State Specialist Hospital, Owerri, South-East Nigeria, is a tertiary health facility established on 22nd January by Imo State Law No 3 of 2018 for the purpose of providing medical services, teaching and research in the field of medicine and related areas; and secondary and tertiary health care services. Owerri is the capital of Imo State, and the largest city in 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 The IMSSH is a public hospital and serves Imo and the neighbouring States of Rivers, Abia, Anambra and beyond.

Neurosurgical services started with outpatient consultations in April 2021 and later the first neurosurgery procedure, a cranial surgery, was performed in the same month. Spine surgery services started in August 2021 with the purchase of a C-arm x-ray machine which was deployed to the neurosurgery theatre. We review the demographics of the spine surgeries performed at the hospital in the first 3 years since commencement of spine surgery.

MATERIALS AND METHODS

This was a retrospective data-based study of all spinal pathologies operatively managed at the Imo State Specialist Hospital, Owerri, Nigeria over a period of 3 years.

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 spinal pathologies from August 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, percentages and standard deviation of variables were worked out.

RESULTS

During the 3-year (36 months) study period, 157 patients had spine surgeries, giving an average of 4 spine 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	157
Male	98 (62.4%)
Female	59 (37.6%)
M: F	1.7: 1
Mean age (years)	54±16.03
Mean age for males (years)	53±17.18
Mean age for females (years)	55±14.05
Peak age range	60-79 (n=68, 43.3%)

The mean age of all patients that underwent spine surgery during the study period was 54 ± 16.03 years (range 13-81 years, median 58 years). The mean age for male patients was 53 ± 17.18 years (range 13-81 years, median 56 years) while that of female patients was 55 ± 14.05 years (range 20-78 years, median 61 years). The peak age range was in the age group 60-79 years accounting for 43.3% (n=68%) of patients and corresponding to the elderly age group, followed by the middle age group, 40 – 59 years (n=58, 36.9%) (Table 2).

The gender distribution of patients according to the location of spine surgery is shown in table 3 with males (62.4%) having higher frequency than females (37.6%) overall and also having higher number of patients for cervical, thoracolumbar and lumbar spine procedures, while females had higher number of patients for lumbosacral spine procedures.

The location of spine surgery procedures in relation to age of patients is shown in table 4 with the highest frequency of spine surgeries noted to have been performed in the lumbar spine (n=43, 27.4%), lumbosacral spine (n=42, 26.8% and cervical spine (n=42, 26.8%). This was followed by thoracolumbar junction (n=13, 8.3%) and thoracic spine (n=8, 5.1%), while cervicothoracic junction, sacral and lumbosacropelvic accounted for 1.9% (n=3) each. Table 5 shows that degenerative spine diseases (71.9%) accounted for the highest number of spine cases, followed by spinal trauma (19.7%) and spinal tumours (3.9%).

Table 2: Age of patients at presentation

Gender/Age group	0-19	20-39	40-59	60-79	80-99	Total	Percent
Male	2	17	39	36	4	98	62.4%
Female	-	8	19	32	-	59	37.6%
Total	2	25	58	68	4	157	100%
Percent	1.3%	15.9%	36.9%	43.3%	2.6%	100%	

Table 3: Gender distribution of patients according to location of spine surgery

Spine Surgery	Male	Female	Total	Percentage
Cervical	32	10	42	26.8%
Cervicothoracic	2	1	3	1.9%



Thoracic	4	4	8	5.1%
Thoracolumbar	12	1	13	8.3%
Lumbar	27	16	43	27.3%
Lumbosacral	18	24	42	26.8%
Sacral	2	1	3	1.9%
Lumbosacropelvic	1	2	3	1.9%
Total	98	59	157	100

Table 4: Location of spine surgery procedures in relation to age of patients

Age Interval	0-19		20-39		40-59		60-79		80-99		Total	Percent
Types of Spine Surgery	M	F	M	F	M	F	M	F	M	F		
Cervical	-	-	7	4	13	1	10	5	2	-	42	26.8%
Cervicothoracic	-	-	-	-	-	-	2	1	-	-	3	1.9%
Thoracic	-	-	1	1	2	1	1	2	-	-	8	5.1%
Thoracolumbar	2	-	5	-	5	-	-	1	-	-	13	8.3%
Lumbar	-	-	2	2	12	3	12	11	1	-	43	27.3%
Lumbosacral	-	-	1	1	6	11	10	12	1	-	42	26.8%
Sacral	-	-	1	-	-	1	1	-	-	-	3	1.9%
Lumbosacropelvic	-	-	-	-	1	2	-	-	-	-	3	1.9%
Total	2		17	8	39	19	36	32	4	-	157	100%

Table 5: Age distribution of patients according to spine pathology

Age Interval	0-19		20-39		40-59		60-79		80-99		Total	Percent
Symptoms of Spine Surgery	M	F	M	F	M	F	M	F	M	F		
Degenerative	-	-	2	3	25	17	32	30	4	-	113	71.9%
Trauma	2	-	13	3	10	-	1	2	-	-	31	19.7%
Infection	-	-	1	1	1	-	1	-	-	-	4	2.6%
Tumour	-	-	-	1	1	2	2	-	-	-	6	3.9%
Congenital	-	-	1	-	-	-	-	-	-	-	1	0.6%
Syringomyelia	-	-	-	-	2	-	-	-	-	-	2	1.3%
Total	2	-	17	8	39	19	36	32	4	-	157	100%

DISCUSSION

There are increasing number of neurosurgeons globally especially in the last decade. Many training Centres for neurosurgeons have been developed, and many neurosurgeons have been trained consequently. Countries which hitherto have no neurosurgeons now offer neurosurgery services, while more hospitals are also able to add neurosurgery services to their array of healthcare services. This is the situation in Nigeria which had a dearth of neurosurgeons prior to 2010 when the training Centres were mainly in Lagos and Ibadan.² Subsequently other training Centres were established in Enugu, Sokoto, Abuja and Benin. However, the training of neurosurgeons in most cases empowers the young neurosurgeon with confident cranial surgery services but limited spine surgeries, mostly related to spinal oncology procedures/laminectomy related procedures.^{3,4} Complex spine surgeries were limited to Orthopaedic Centres and spine surgeries were therefore seen as part of Orthopaedic practice. The author had his training at Charlotte Maxeke Johannesburg Academic Hospital and Chris Hani Baragwanath Academic Hospital, both of which are Teaching Hospitals of the University of the Witwatersrand, Johannesburg, South Africa. There were some good exposures to complex spine surgeries during the training at the two hospitals. Opara et al⁵ in their recent report highlighted factors to be considered that will aid the commencement of spine surgeries in a hospital with neurosurgery services.



The findings in the 3 years review of spine surgeries performed at the Imo State Specialist Hospital, Owerri, show that there were more males (n=98, 62.4%) than females (n=59, 37.6%) with a male to female ratio of 1.7:1. This is similar to the findings in a preliminary 21 months study in the same hospital by Opara et al⁵ which also had a higher number of males (n=42, 58.3%) than females (n=30, 41.7%). Also in a 2-year study by Adebe et al⁶ in Addis Ababa, Ethiopia, there were male preponderance in all their spine surgeries. The peak age range (60-79 years) in the study at IMSSH, Owerri, (n=68, 43.3%) corresponds to the elderly age group, followed by the middle age group, 40-59 years (n=58, 36.9%). This is not surprising when correlated with the finding of degenerative diseases being the highest pathology responsible for spine surgeries during the study period (n=113, 71.9%). The number of spine surgeries (n=157) over the first 3 years since the commencement of spine surgeries in the hospital is higher than other studies in our environment.^{3,4,7} Udoh et al,³ in their 8-year study in Benin, Nigeria, had 127 spine surgeries for canal stenosis and 2 spine surgeries for spine tumours and 55 spine surgeries for spine trauma. Lasseini et al⁴ in Sokoto in their 5 years study had 42 spine interventions (laminectomy or ACDF), while Ogunleye et al⁷ in Bauchi had 18 spine surgeries (ACDF-6; Laminectomy-5; Thoracic pedicle screw fixation-2; T-L pedicle screw fixation-3; Lumbar pedicle screw fixation-2) over a 6 years period. Adebe et al⁶ in their 2 years study in 2 major Neurosurgery Centres in Addis Ababa had high figures for spine surgeries (n=215 in adults; n=6 in children). Jabang et al⁸ in their 18 months study in Banjul, Gambia had 25 spine surgeries (laminectomy cases=13 and spine internal fixation cases=12). Kaptigan et al⁹ in their 9 years study in Papua New Guinea had 51 spine procedures. Heng et al¹⁰ in Sarawak, Malaysia in their 7 years study had 49 spine interventions. The above literature review revealed a generally low spine surgery rate in resource poor settings and this may be attributed to limited operative capacity of neurosurgical services in resource poor settings including non-availability of modern diagnostic neuroimaging such as Computerized Tomography (CT) scans and Magnetic Resonance Imaging (MRI), shared operating room theatres with other surgical specialties, etc.^{6,9,11} Despite being a new spine surgery centre, the high number of spine surgeries in IMSSH, Owerri, when compared to other Centres may reflect the confidence patients have in the experience and skill of the spine surgeons in the hospital. Udoh et al³ in their study noted three major factors that affects the volume and outcome relationship of neurosurgical operations in resource limited settings and these include patient factors, the experience and skill of the attendant team and; hospital and government policies which influence the initial Workforce. It may also be surmised that satisfactory postoperative outcome which serves as an advert for a hospital's surgical services, may play a role in patient's utilization of the spine services at IMSSH, as patients who have received care at the hospital will broadcast the positive outcome after their surgeries to friends and relatives in the community after discharge home.

The highest frequency of spine surgeries in our hospital was performed in the lumbar (n=43, 27.3%), lumbosacral (n=42, 26.8%) and cervical spines (n=42, 26.8%) almost in equal proportion. This was followed by thoracolumbar junction (n=13, 8.3%) and thoracic spine (n=8, 5.1%), while cervicothoracic junction, sacral and lumbosacropelvic accounted for 1.9% (n=3) each. Degenerative spine diseases (71.9%) accounted for the highest number of spine cases, followed by spinal trauma (19.7%) and spinal tumours (3.9%). This is similar to the findings in the study by Udo et al[#] who had 127 spine surgeries for canal stenosis (most commonly from degenerative spine diseases), 55 spine surgeries from spine trauma and 2 spine surgeries from spine tumours.

CONCLUSION

The study showed a male preponderance for spinal pathologies surgically managed in the hospital, with degenerative spine diseases as the leading cause of presentation for spine consultation and surgeries in our urban environment. It also highlights the fact that spine pathologies are not rare in our urban environment, hence there is need to improve access to spine care in our resource poor setting by encouraging more doctors to take up training to become spine surgeons to help in tackling these pathologies in our environment.

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