

Demographic Profile Pattern of Spina Bifida in Enugu, South-Eastern Nigeria

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-----ABSTRACT-----

Background: Spina bifida is the most common but treatable form of the neural tube defects (NTDs). Its management all over the world especially in the sub-Saharan Africa can be potentially devastating due to prevailing low socioeconomic status, harmful taboos, religious beliefs and inadequate medical facilities. The treatment especially the severe type like myelomeningocele remains nightmarish as such patients' treatment and follow is life-long. The aim of this research is to review the demographic profile pattern of spina bifida in Enugu, South eastern, Nigeria.

Method: A retrospective cross-sectional study was done between 2011 and 2018. The demographic profiles of children who were delivered or who presented with Spina Bifida and treated at Enugu State University Teaching Hospital (ESUT) were extracted. Data was collected from patient folders, admission registers in both neurosurgical and Special Newborn Intensive care wards and analyzed using the Statistical Program for the Social Sciences (SPSS, version 22.0, 2013, IBM).

Result: A total of seventy two children were reviewed in the study. Majority (54%) of the patients were males. Myelomeningocele was the most common (81%) defect and the lumbosacral region was the commonest site (80.6%) ($p < 0.001$). Non-syndromic spina bifida represented the majority of the cases (83%) while 14% and 3% of spina bifida patients presented with hydrocephalus and talipes equinovarus respectively.

Conclusion: This study suggests that spina bifida still occurs in South Eastern Nigeria. Public health measures aimed at the prevention of this anomaly should be encouraged

Key words: Spina bifida, Birth defects, Congenital Anomalies, Neural Tube Defects,

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I. INTRODUCTION

Spina bifida (SB) is a common congenital defect of the spinal column, often resulting in severe disabilities. It occurs following an incomplete closure of the posterior components of the vertebrae at approximately day 28 of human gestation (Sadler, 2012). It is the second most common cause of childhood disability after cerebral palsy (Özaras., 2015).

In classical classification, according to Sahmat et al., (2017) spina bifida has two types; closed (spina bifida occulta) and open (spina bifida cystica). Spina bifida cystica is associated with a protruding cyst made up of either meninges (meningocele) or meninges in combination with spinal cord tissue (meningomyelocele) (Özaras., 2015). These lesions are frequently associated with spinal cord dysfunction, hydrocephalus, and syringomyelia (Ali et al., 2014).

The prevalence of spina bifida varies across regions, race and ethnicity (Byabatoet al., 2012). Despite folic acid fortification of diet and health education, it accounts for as many as 4.7 in 10,000 live births worldwide (Özaras., 2015) with the estimated prevalence being 2-3 per 10,000 live births in United States of America (Thibadeau et al., 2017); 7.8-8.4 per 10,000 for males and 9.0-9.4 per 10,000 for females in the United Kingdom (Lawrenson et al., 2000). According to Mohd-Zin et al., (2017), reported studies in parts of Asia and Africa have been recorded as being low in occurrence in comparison to other birth defects but questions have arisen with regard to record taking and data management in these regions of the world. Gender preponderance also differs according to country; in the United States of America, spina bifida is thought to be more prevalent in girls than in boys (Mohd-Zinet al., 2017).

Detailed descriptions about spina bifida in south-eastern Nigeria are rarely found in the literature. This study focuses on the pattern of occurrence of the spina bifida in Enugu, Southeastern Nigeria.

II. METHODOLOGY

The study ethical clearance and approval was sought and obtained from Enugu State University Teaching Hospital (ESUTH), South-eastern Nigeria. ESUTH is a state government-funded medical institution situated inside Enugu metropolis. It serves as a regional referral hospital for the entire Enugu and other surrounding states.

III. DATA COLLECTION

This study is descriptive retrospective cross-sectional study. A total of seventy two (72) patients were studied. Using a checklist, demographic profile data was collected from medical records, ward registers in neurosurgery, pediatric, special newborn, pediatric surgery and postnatal wards of ESUT Teaching Hospital from 2011-2018.

Data captured included (a) demographic details on patient's ethnicity, gender, and date of birth, (b) details of defects on diagnosis, Type (open or closed lesion), level of lesion, and syndromic or non-syndromic; (c) Associated congenital malformation

IV. STATISTICAL ANALYSIS

Data obtained were fed into the computer using statistical package for social sciences (SPSS, version 22.0, 2013, IBM corp) software package. Contingency table was used to display frequency distribution of the ethnicity and genders based on the types of diagnosis and tested using Chi-square. Differences with $p < 0.05$ were considered significant indicating a relationship between the variables.

V. RESULTS:

Sex distribution: Distribution of spina bifida with associated
M=39(54.17%) F=33(44.83%). Congenital anomaly

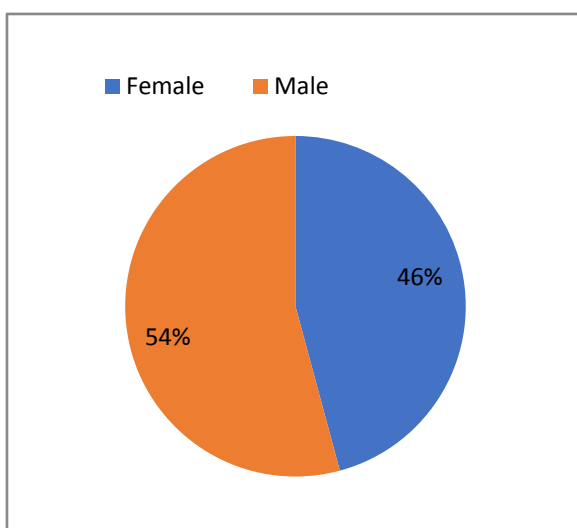


Figure 1

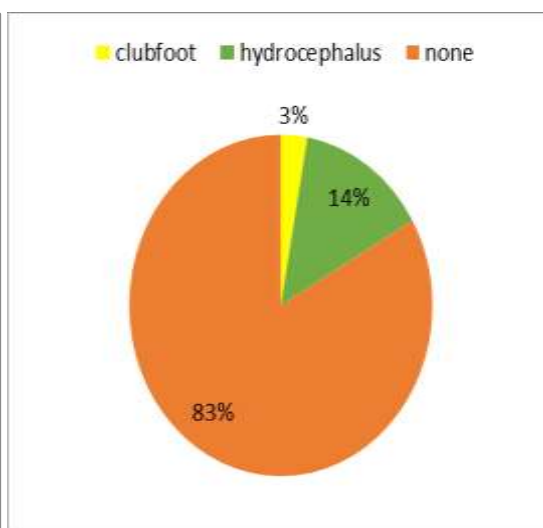


Figure 2

Seventy-two patients with spina bifida were enrolled in this study. Their age ranged from the first day of the life to 4 years. Sixty-two (86.1%) of the population had myelomeningocele, nine (12.5%) meningocele. One case (1.4%) presented with occult spina bifida (Table 1). Non-syndromic spina bifida represented the majority of the cases (83%). In this study, 14% ($n = 10$) of spina bifida patients also had hydrocephalus, while 3% ($n = 2$) had club foot. (Figure 2)

Table (2) shows the anatomical distribution of the spina bifida deformity in all cases. The lumbosacral region was the commonest site of occurrence of spina bifida in (80.6%) of cases, followed by the lumbar region in (12.5%) of cases, then thoracolumbar region (2.8%).

Table 1: Sex incidence of different types of spina bifida in 72 children.

Types	Males		Females		Total	
	No	%	No	%	No	%
Meningocele	4	5.6	5	6.9	9	12.5
Myelomeningocele	33	45.8	29	40.2	62	86.1
Occulta	1	1.4	0	0	1	1.4
Total	38	52.8	34	47.1	72	100

Table 2: Distribution Based on Types of Spina Bifida by Location

Site	Meningocele	Myelomeninocele	Occulta	Total	%
Cervical	0	1	0	1	1.4
Thoracic	0	1	0	1	1.4
Thoracolumbar	0	2	0	2	2.8
Lumbar	4	5	0	9	12.5
Lumbosacral	5	52	1	58	86.6
Sacral	0	1	0	1	1.4
Total	9	62	1	72	100

VI. DISCUSSION

Spina bifida is a common congenital midline fusion defect of the nervous system. It is a potentially life-threatening condition affecting between two and four per thousand infants. Spina bifida is the most common and complex neural tube defect. Geographic disparities and gender differences in terms of spina bifida prevalence and incidence have been widely reported. Also within-country, differences have been observed between racial and ethnic groups (Coppet al., 2016).

It has been observed that gender differences clearly exist in the prevalence of Spina bifida. The results of this current study showed there were more males with spina bifida than females. This is in line with the findings from some researches done in some sub-Saharan African countries like Nigeria and Cameroon which have presented results showing male predominance (Margaronet al., 2010). However, Mweshiet al., (2015) reported in literature that spina bifida tends to be more common in females than in males. The probable explanation for the above may be connected to ethno-theories where boys are much more treasured than girls in most societies in sub-Saharan Africa (Mweshiet al., 2015). Our data conform to the global scenario of myelomeningocele reported as the most common and severe form of spina bifida (Coppet al., 2015) (Table 1). In our study, myelomeningocele was seen as the most common form of spina bifida (62; 86.1%). This postulation has been supported by the results of a prospective study done in a large Cosmopolitan Western African City, which showed that the most common defect in the children with NTDs was myelomeningocele (Fieggnet al., 2014). However, this is in contrast to another study by Shehuet al., (2000) on spina bifida cystica in Zaria, Nigeria that reported that more children had meningocele compared with myelomeningocele.

According to the anatomical distribution of the lesion, the most commonly reported level of spina bifida lesion was at the lumbosacral region (86.6%, n=52), followed by the lumbar (12.5%, n=9) (table 2). This result confirms the findings of Idowu and Apemiye, (2008) who reported that the lumbosacral region is the most common site of spina bifida lesion. Conversely, Mweshiet al., 2015 reported that the Lumbar region is the most common site for spina bifida. Again, in contrast, a study done in Zambia showed the sacral region to be the most common site of occurrence (Mweshi, 2015). Non-syndromic spina bifida represented the majority of the cases 83% (n=59). In this study, 14% (n=10) of spina bifida patients also had hydrocephalus which does conform with long and well established fact in literature that 80% of patients with myelomeningocele do have hydrocephalus. This is seen in a Chiari 2 malformation. This disparity in our finding in this study can be attributed low population study and due to the fact that it was a retrospective study in which case many of the patients with spina bifida might not be captured in the hospital or records when they eventually develop hydrocephalus. In this study, 3% (n=2) were associated with club foot (talipes equinovarus). Our finding is not consistent with the study in Kano where Hydrocephalus was present in 100% of cases of spina bifida and further negates the finding in another study done in Jos, Nigeria, with club foot (talipes equinovarus) (35.7%) being the major associated anomaly (Nnadi and Singh, 2016).

V. CONCLUSION:

Spina bifida still exists in Southeastern Nigeria. Although we did not look into the management in this research, but no doubt it will still be constituting some social and traditional embarrassments. Public health measures aimed at the prevention of this anomaly should be encouraged and probably the teaming female reproductive age being the main target audience.

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Conflicts of Interest: There are no conflicts of interest.

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