

## MANAGEMENT AND OUTCOMES OF SPINA BIFIDA IN A TERTIARY HOSPITAL, NORTHEASTERN NIGERIA- A CALL FOR ACTION

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### ABSTRACT:

**Background:** Spina bifida (SB) is one of the common congenital causes of paediatric morbidity and mortality resulting from an incomplete closing of the backbone and membranes around the spinal cord.

**Objectives:** To review the management and outcome of SB among children admitted and attending Paediatric surgical unit (PSU) of our tertiary hospital.

**Methods:** This was a prospective study involving patients with SB coming to the PSU of the Federal Teaching Hospital, Gombe from January, 2008 to December, 2010.

**Results:** A total of 84 patients with SB were admitted with 54.8% males and 45.2% females. Of the 84 patients with SB only 26.2% had regular antenatal care, while 73.8% had none. Hausa ethnic group had higher rate of SB (28.6%). Most of the patients belongs to families of lower social class; ( $p = 0.001$ ). The commonest site was Lumbosacral region and 76.2% patients had excision under general anaesthesia while the mortality rate was 18.9%.

**Conclusion:** The management of patients with SB was challenging but with early presentation the outcome is usually good as the case in this study.

**Keywords:** Management, Nigeria, Outcomes, Spina Bifida.



### INTRODUCTION

Spina bifida (SB) is a birth defect where there is an incomplete closing of the backbone and membranes around the spinal cord. There are three main types: spina bifida occulta, meningocele and myelomeningocele.<sup>[1]</sup> The most common location is the lower back, but in rare cases it may be in the middle back or neck. Spina bifida occulta has no or only mild signs which include a hairy patch, dimple, dark spot or swelling on the back at the site of the gap in the spine. On the other hand, Meningocele typically causes mild problems with a sac

of fluid present at the gap in the sac. In myelomeningocele, also known as open spina bifida, is the most severe form that is associated with poor ability to walk, problems with bladder or bowel control, hydrocephalus, a tethered spinal cord and latex allergy.<sup>[2]</sup>

SB is believed to be due to a combination of genetic and environmental factors.<sup>[3]</sup> After having one child with the condition or if one of the parents has the condition there is a 4% chance that the next child will also be

affected. [4] Most of the spina bifida can be prevented if the mother get enough folic acid before and during pregnancy, Open spina bifida can be significantly closed before or after birth. A shunt may be needed in those with hydrocephalus and tethered spinal cord may be surgically repaired.

The incidence is generally low among the black population of the world.<sup>[5,6]</sup> However, this trend it seen to be changing based on the incidence of cases seen in our centre. Therefore, this study is aimed at reviewing the management and outcome of Spina bifida in our centre.

## MATERIALS AND METHODS

This was a prospective study of patients that presented with spina bifida to the paediatric surgical unit of the Federal Teaching Hospital, Gombe from January 2008 to December, 2010. Details of the socio-demographic data, presenting complain, anatomical site of the defects, associated anomalies, either ulcerated or ruptured, antenatal care history, family history, radiological investigations, surgical interventions, outcomes, complications and follow-up were recorded in the appropriate sections of the study questionnaires. Data was recorded and analyzed using SPSS (Statistical Package for Social Sciences) version 11.0 Inc. Standard, 2001. The results were presented as frequency, percentages and chi squares determined where appropriate. A p-Value of  $\leq 0.05$  was considered statistically significant.

Ethical clearance was obtained from the research and ethical committee of the hospital.

## RESULTS

A total of 84 patients with spina bifida were admitted over the study period. The subjects comprise of 46 (54.8%) males and 38 (45.2%) females, with M: F ratio of 1.2: 1 with no gender difference ( $\lambda^2 = 1.667$ ,  $p = 0.14$ ). The ages of the mothers ranged from 18-35 years as shown in table I.

Most of the mothers, 62 (73.8%), of the babies with spina bifida had no ante natal care while only 22 (26.2%) mothers had regular antenatal care, and the difference significance ( $p < 0.0001$ ). Out of 22 mothers that had antenatal only 8 (36.36%) started the antenatal care at the first trimester while the remaining either started in the second or the third trimester. A total of 36 (42.9 %) babies were delivered in the hospital out of which only 2 (5.6%) babies were delivered at the Federal Teaching Hospital, Gombe. The remaining 48 (57.1%) babies were delivered at home.

Hausa ethnic group has shown to have higher rate of spina bifida with 28.6% followed by the Fulanis with 14.3% cases of spina bifida; table II.

The site of the defects was mostly located at the Lumbosacral region in forty patients made up 47.62% of the patients as shown in table III.

Neurological associated anomalies were most commonly as seen in 20 patients as shown in table IV below.

Sixty-four (64) patients were operated under general anaesthesia while the rest had non-surgical intervention. Out of the 64 patients that had excision under general anaesthesia 52 (81.3%) patients were discharge home with 81.3% success rate and the mortality rate was 18.7% following surgical interventions. Table V shows the different postoperative complications following surgical excision.

## DISCUSSION

The findings of more males than females with spina bifida in this study concur with the previous studies done elsewhere.<sup>[7,8]</sup> This male preponderance may not be unconnected to the social habit of the high demand for male child that propel the parents to present to the hospital for medical care. However, in a similar controlled prospective study by Adeloje [9], he found that approximately equal male and female ratios which was contrary to the findings in this study. This variation could be due to the differences in the regional and genetic factors.

In this study we found that most of the patients with SB belonged to the lower social class and this is in consonant with previous studies [8,9]. this may not unconnected to the fact that diseases are closely associated with poverty and ignorance as seen in the developing countries like ours.

The finding in this study that babies with spina bifida were more among the mothers in the age group of 18-22 years may be due to the fact that most of the developing countries like Nigeria and indeed the North-eastern of the country is bedeviled to be associated with poverty, ignorance and diseases. Furthermore, majority of the marriages do take place within the above age brackets visa-vis the deliveries. This was in variance with the study by Bello *et al*<sup>[10]</sup>, where they found that the highest rates were found among the mothers in the age's range of 26-35 years. However, there was no explanation given for the probable association of spina bifida with advance age group in their study.

We observed in this study that most of the babies that presented with SB had no antenatal care in contrast to the study by Bello *et al*<sup>[10]</sup>, where they reported higher rate of SB among those mothers who attended antenatal care. However, Bello *et al*<sup>[10]</sup>, reported higher antenatal attendance but advocated the high incidence of SB occurring among the mothers to late presentation in the second and third trimester of pregnancy. Furthermore, this underscore the need for early commencement of folic acid to pregnant mothers in order to prevent the occurrence of SB and other neural tube defects as was also documented in the literature.<sup>[11]</sup>

Our study reveals that majority of babies that presented with SB were of Hausa ethnic group and this could be due to the fact that Hausa language is dominant

as compared to other tribes in this region and indeed some minorities can equally claim to be Hausa when asked. However, in the similar study at the University of Maiduguri Teaching Hospital, Maiduguri, it was reported that Kanuri was found with the highest incidence this may not be unconnected to the population of Kanuri in Maiduguri and also some minorities in Maiduguri also claim to be Kanuris. The results in this study concur with the findings of Uba *et al*<sup>[12]</sup>, in the North central, Nigeria which puts the incidence of SB to be higher amongst the Hausa-Fulani ethnic group.

The most frequent site of SB in this study was the Lumbosacral region which is in keeping with the studies reported by other workers.<sup>[9,10,11]</sup> There were no gender differences among those found with lumbosacral SB, this finding was similar to those reported by other workers.<sup>[9,10,11]</sup> Similarly, due to the anatomical reasons these neuromuscular and skeletal anomalies were generally uncommon with the lesion higher up in the spine. This finding was similar to the result obtained by Terna *et al*<sup>[8]</sup> in their previous study.

The higher incidence of hydrocephalus complicating SB found at presentation in this study was different from that documented in previous studies<sup>[6,13]</sup> where they reported lower incidences of hydrocephalus as a complication of SB. Hydrocephalus was the common post-operative complications following excision of SB and this was lower than

the results obtained in a study by Terna *et al*.<sup>[8]</sup> All the complications were appropriately managed with majority of the patients had surgical excision and were discharge home. Only ten patients died in the course of management due to one complication or other.

Most patients were lost to follow up within weeks to months of discharge and only two patients were follow-up for up to three years because their parents were educated and were willing to assist their children.

The management of patients with SB however, needs multi-disiplinary approach which includes the paediatricians, surgeons (Paediatrics surgeons, Neuro-surgeons, Anaesthetists, Orthopaedic surgeons, Urologist etc), physiotherapists /occupational therapist among others. We therefore wish to suggest that more advocacy and enlightenment is needed among all the stakeholders to reduce the preventable diseases called Spina bifida with simple early antenatal care and the administration of Folic acid during the first trimester.

We therefore, recommend that government and indeed non-governmental organizations are to encourage and also increase the enlightenment campaign on the need for mothers to attend antenatal care, to do that within the first trimester and also to take folic acid before and during pregnancy, more especially within the first trimester.

## CONCLUSIONS

The management of patients with SB at the Federal Teaching Hospital, Gombe

was challenging but when patients present early and without or with minimal complications the outcome is usually good.

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**TABLES:****TABLE 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE STUDY POPULATION**

Age of babies (days)	Number (N)	Percent(%)	p-Value
1-7	34	40.5	
8-14	28	33.3	
15-21	10	11.9	
22-29	07	08.3	
>30	05	06.0	
Sex of Babies			
Male	46	54.8	
Female	38	45.2	0.28
Social class			
Upper	12	14.3	
Middle	24	28.6	0.04
Low	48	57.1	0.01
Tribes			
Hausa	30	35.7	
Fulani	16	19.1	
Bolewa	14	16.7	
Tera	9	10.7	
Babur	8	9.5	
Others	7	8.3	
Total	84	100	

**TABLE 2: NUMBER OF BABIES' DELIVERED BY AGES OF THE MOTHERS**

Age of mothers (Years)	Number of babies n (%)	Total n (%)
18-23	30 (35.1%)	30 (35.7%)
24-28	18 (21.4%)	48 (57.1%)
29-33	28 (33.3%)	76 (90.5%)
>33	08 (9.5%)	84 (100%)
Total	84 (100%)	

**TABLE 3: SITES OF THE NEURAL TUBES DEFECTS CATEGORIZED BY GENDER**

Site of the defect	Gender, n (%)		Total, n (%)
	Male	Female	
Lumbosacral	20 (23.8)	20 (23.8)	40 (47.6)
Sacral	10 (11.9)	6 (7.1)	16 (19.1)
Thoracolumbar	6 (7.1)	8 (9.2)	14 (16.7)
Lumbar	8 (9.5)	2 (2.4)	10 (11.9)
Thoracic	2 (2.4)	2 (2.4)	4 (4.8)
Total	46 (54.8)	38 (45.2)	84 (100)

TABLE 4: ASSOCIATED COMPLICATIONS IN VARIOUS LOCATIONS

Locations	Neurological n (%)	Hydrocephalus n (%)	Club foot n (%)	Others n (%)	Total
Lumbar	4(20)	-	4(28.6)	2(20)	10
Lumbosacral	4(20)	10(71.4)	2(14.3)	3(30)	19
Thoracic	2(10)	-	-	2(20)	04
Thoracolumbar	8(40)	-	4(28.6)	1(10)	13
Sacral	2(10)	4(28.6)	4(28.6)	2(20)	12
Total	20(100)	14(100)	14(100)	10(100)	

TABLE 5: SHOWS THE COMPLICATIONS FOLLOWING SURGICAL INTERVENTIONS AND THE OUTCOMES.

Types of complications	Outcomes		
	Discharge n (%)	Dead n (%)	Total n (%)
Meningitis	2(3.23)	3(30)	5(8.07)
CSF leakages	1(1.92)	2(20)	3(4.84)
Hydrocephalus	4(22.58)	2(20)	6(9.68)
Recurrent swellings	1(1.92)	-	1(1.61)
Total	52(83.9)	10(19.2)	62(100)