

Plant Science and Physiology

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ABSTRACT

Neural Tube Defects (NTDs) are the world's second most common birth defects after cardiovascular defects. In developing countries like Zambia, these defects are unrecognized and under reported. Despite the administration of folic acid, there have been incidences of NTDs though no local literature points out the frequency of these defects. In order to make informed interventions and programmatic decisions that will achieve significant reductions in patients with NTDs, local studies are needed. There is a need to describe the burden of NTDs and identify gaps in available NTD data. Therefore, the aim of this study is to determine the frequency and distribution of Neural Tube Defects (NTDs) at Arthur Davison Children Hospital (ADCH).

INTRODUCTION

Global estimates of birth defects indicate that 7.9 million children are born with birth defects each year and of these 90% are born in low- and middle-income countries. Neural Tube Defects (NTDs) are the second most common group of serious birth defects, following cardiac abnormalities, which result in infant mortality and severe disability. The worldwide incidence of NTDs is estimated to range between 1.0 and 10.0 per 1000 births. A systematic literature review on NTDs found that the reported incidence of NTDs varied greatly between and within regions. The regional incidence per 10,000 births was 11.7 in Africa, 21.9 in the Eastern Mediterranean, 9 in Europe, 11.5 in the Americas, 15.8 in South-East Asia and 6.9 in the Western Pacific. In hospital-based retrospective studies, an incidence of 7.5 per 1000 births was reported in Algeria (2004-2006), 3.5/1000 births in Sudan (2003-2004) and 2.2/1000 births in Nigeria (2011-2013). A retrospective study at a paediatric neurosurgical centre in Kenya (2005-2010) reported the incidence of spina bifida and encephalocele as 3.3/10 000 live births [1-4]. In Zambia, a retrospective review of congenital anomalies at Arthur Davison Children Hospital (ADH) in Ndola district found CNS congenital anomalies to be the most common (40%). Hospital based prevalence and incidence rates which are common practice of reporting prevalence and incidence rates in most low and middle income countries may not reflect the actual prevalence. Neural tube defects are reported to cause approximately 88,000 deaths globally (in 2012) and 8.6 million disability adjusted life years. In Zambia, all children born with NTDs and in need of surgery have to be transported to Lusaka for surgical management because specialist surgery is only available at the University Teaching Hospital (UTH)

and Beit Cure Hospital, both of which are in Lusaka, the capital city of Zambia. Nevertheless, Closure of the open myelomeningocele is advisable within 24 hours, or 48 hours at most, as closure beyond this period results in infection of the defect. To add on there has been no study that has been carried out in the northern part of Zambia only some studies based in Lusaka at UTH, which showed that the most common NTD was spinal bifida and most of the patients were from Lusaka province while the least number of patients were from the Copper belt province. That's why carrying out this study to determine the frequency and pattern of distribution of neural tube defects at ADH will help provide information, that may help in implementing policies that may bring management of these defects at the doorstep like opening neurosurgery services at the hospital unlike always evacuating patients to Lusaka always and to reduce mortality rate from these defects. Lastly the study may also help in effective sensitization on the importance of taking folic acid by pregnant women and abstaining from factors that may lead to NTDs. A cross sectional retrospective study was conducted to review medical records of children aged 1 day-5 years who attended ADCH between 2018 and 2020 w [5-7]. All children that were attended to during the study period were included in the study provided they meet the inclusion criteria. Data was collected using a data extraction sheet and descriptive analysis was done using Statistical Package for Social Science (SPSS).

RESULTS

A total of 52 patients with NTDs were identified from October 2018-May 2020 patients' registers, which constituted the study sample. The sample had more boys 61.5% than girls 38.5% female

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with the majority 78.8% aged between one day to twenty-eight days [8-10]. The majority of the children were from Copper belt province with 88.5%, while the minority was from Muchinga province 1.9%. However, the majority of children were from Ndola district 61.5% and the minority from Mpika district 1.9%. The study showed that many children (96.2%) presented with Spinal Bifida (SB) and lastly encephalocele (3.8%). Myelomeningocele was the most common type of SB (21.2%). Hydrocephalus was the most common associated anomaly (19.2%) while the least associated anomaly was Microcephaly (3.8%).

CONCLUSION

The study showed that the majority of children were from Ndola district on the Copper belt province and most children were admitted between day one and twenty-eight days after birth. SB was the most common type of NTDs, and among these, those with myelomeningocele were the majority. Hydrocephalus was the most common associated impairment with majority of patients not undergoing any surgical interventions. The findings from this record review suggest that management of children with NTDs in Zambia is faced with challenges such as late presentation. This is consistent with literature which indicates that developing countries have higher incidences of children with NTDs and yet are faced with many challenges related to prevention and management.

REFERENCES

1. Adeleye AO, Dairo MD, Olowookere KG. Central nervous system congenital malformations in a developing country: Issues and challenges against their prevention. *Child's Nerv Sys.* 2010;26:919-924.
2. Bussuk AG, Kibar Z. Genetic basis of neural tube defects. *Sem Pedia Neurol.* 2009;16:101-110.
3. Christianson A, Howson C, Modell B. March of Dimes global report on birth defects: The hidden toll of dying and disabled children. March of Dimes Birth Defects Foundation, New York.
4. De Paul, Djientcheu V, Njamnshi AK, Wonkam A. Management of neural tube defects in a Sub-Saharan African country: the situation in Yaounde, Cameroon. *J Neurol Sci.* 2008; 275:29-32.
5. Elsheikh GEA, Ibrahim SA. Neural tube defects in Omdurman Maternity Hospital. Sudan. *Khartoum Med J.* 2009;2:185-190.
6. Farmer PE, Kim JY. Surgery and global health: A view from beyond the OR. *World J Sur.* 2008;32:533-536.
7. Feikin DR, Nguyen LM, Adazu K. The impact of distance of residence from a peripheral health facility on pediatric health utilisation in rural western Kenya. *Trop Med Int Health.* 2009;14:54-61.
8. Githuku JN, Azofeifa A, Valencia D, Ao T, Hamner H, Amwayi S, et al. Assessing the prevalence of spina bifida and encephalocele in a Kenyan hospital from 2005-2010: Implications for a neural tube defects surveillance system. *Pan Afr Med J.* 2014;18:60.
9. Greene ND, Stanier P, Moore GE. The emerging role of epigenetic mechanisms in the etiology of neural tube defects. *Epigen.* 2011;6:875-883.
10. Greene ND, Stanier P, Copp AJ. Genetics of human neural tube defects. *Hum Mol Genet.* 2009;18:113-129.