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Original Research Paper

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DEMOGRAPHIC PROFILE OF NEURAL TUBE DEFECT PATIENTS IN NEUROSURGERY DEPARTMENT IN MAHARANI LAXMI BAI MEDICAL COLLEGE, JHANSI

Dr.Pankaj Pawar	Resident, Department of Surgery, M.L.B. Medical College, Jhansi
Dr. Dinesh Rajput*	Assistant Professor Neuro Surgery, M.L.B. Medical College, Jhansi*Corresponding Author
Dr. Dinesh Shukla	Assistant Professor Neuro Surgery, M.L.B. Medical College, Jhansi
Dr.ShoryaKatiyar	Junior Resident, M.L.B. Medical College, Jhansi
Dr. Sridham Sutradhar	Senior Resident, M.L.B. Medical College, Jhansi

ABSTRACT **Introduction:** Neural Tube Defects are one of the most common congenital anomaly and also one of the most common anomaly that presents to us in our OPDs and emergencies. Neural tube defects are considered a complex disorder because they are caused by a combination of multiple genes and multiple environmental factors. The demography of the various defects vary with ethnicity, geography and maternal age groups. **Material and methods:** A retrospective study was undertaken in the Department of Neurosurgery, Maharani LaxmiBai Medical College, Jhansi over a duration of two years from March 2018 to February 2020. The parameters included the type of the defect, the location, sex ratio, other congenital defects and mortality. **Result:** A total of 80 patients were studied, in which 60% were females and lumbosacral meningomyelocele was the most common neural tube defect in 40% patients. In 15% patients VP Shunting was done and the post operative mortality rate was 6.25%. **Conclusion:** Neural tube defects are still a very common congenital anomaly and better health measures for its prevention need to be encouraged.

KEYWORDS :- Meningomyelocele, neonate, neural tube defect.

INTRODUCTION

Neural Tube Defects are one of the most common congenital anomaly and also one of the most common anomaly that presents to us in our OPDs and emergencies. The overall pooled birth prevalence of neural tube defects in India is 4.5 per 1000 total births. Globally, it is estimated that approximately 300,000 babies are born each year with NTDs, resulting in approximately 88,000 deaths and 8.6 million disability-adjusted life years (DALYs).Embryologically, they are believed to result from failure of closure of the neural tube during neurulation at 21 to 28 gestational days. Neural tube defects are considered a complex disorder because they are caused by a combination of multiple genes and multiple environmental factors. Known environmental factors include folic acid, maternal insulin dependent diabetes, and maternal use of certain anticonvulsant medications. There are two types of NTDs: open, which are more common, and closed. Open NTDs occur when the brain and/or spinal cord are exposed at birth through a defect in the skull or vertebrae. Examples of open NTDs are anencephaly, encephaloceles, hydranencep-haly, iniencephaly, schizencephaly, and spina bifida. Other types of NTDs are called closed NTDs. Closed NTDs occur when the spinal defect is covered by skin. Common examples of closed NTDs are lipomyelomeningocele, lipomeningocele and tethered cord. The demography of the various defects vary with ethnicity, geography and maternal age groups. World literature suggests the highest incidence in Ireland and Wales with 6 cases per 1000 live births.

AIMS

To study the demographic profile of patients with neural tube defects planned for surgery

MATERIAL AND METHODS

A retrospective study was undertaken in the department of neurosurgery, Maharani LaxmiBai Medical College, Jhansi over a duration of two years from march 2018 to february 2020. all patients who were admitted to the neurosurgery department in this duration were included in this study. The total number of patients were 80. The demographic profile of these patients were analysed. The parameters included the type of the defect, the location, sex ratio, associated anomalies and mortality. In addition, the overall incidence of neural tube defects in our center was determined. The values were correlated to world literature.

RESULT

Table 1: Types of neural tube defects

Type	No. of patients
Meningomyelocele	66(82.5%)
Encephalocele	14(17.5%)

Table 2: Location of meningomelocele

Type	No. of patients
Lumbosacral	26(40%)
Lumber	23(35%)
Dorsolumber	13(20%)
Cervical	4(5%)

Table 3: Types of defect and sex ratio

Type	Male	Female
Encephalocele	6(43%)	8(57%)
Meningomyelocele	27(40%)	39(60%)
Total	33(40%)	47(60%)

Table 4: Associated anomalies with neural tube defects

Associated anomaly	Present	Absent
Hydrocephalus	12(15%)	68(85%)
Congenital heart disease	1(1.25%)	79(98.75%)

Table 5: mortality in postoperative period

Types	Mortality
Encephalocele	3
Meningomyelocele	2
Total	5(6.25%)

The results show an increased incidence of patients diagnosed with meningomyelocele amongst all neural tube defects. The meningomyeloceleaccounts for 82.5 % of the total patients of neural tube defects. A study carried out by Amir et al included 78% patient with meningomyelocele and 21% with encephalocele.

A similar study by Kumar R et al had 72% patient with meningomyelocele , so our study agrees with both these studies in terms of incidence of number of patients of myelomeningocele.

Out of all the patients of myelomeningocele admitted for surgery, lumbosacral was the most common position i.e. in 40% patients followed by lumber region which constituted 35% patients. A similar study was carried out by Ghosh Somyodhrity et al in which also had similar data in 340 patients were taken and out of these 54% had lumbosacral meningomyelocele.

In our study 40% patients were male and 60% were female. Similar results were obtained in study by Amir et al where males were 47.6% and 52.4% feamle patients which included total 60 patients. While in study of Ghosh Somyodhrity et al 57% patients were males and 43% patients were females. 15% patients had associated hydrocephalus for which VP SHUNTING was done along with the meningomyelocele excision and repair. One patient was diagnosed with congenital heart disease(ASD) but conclusion from this result cannot be made as all patients were not screened for other congenital disease. Similar to this a study was carried out by Kumar R et al which included 160 patients in which there were 30% patients with hydrocephalus in whom VP shunting was done.

Our study had 6.25% mortality in post operative period in which 3 patients were operated for encephalocele repair and 2 for meningomyelocele repair. Not in many studies post operative mortality has been included, a study which was done by RidoshM et al,which included 9000 patients and mortality rate was 13% in duration of 7 years. This high mortality rate was probably due to large number of patients which were studied.

DISCUSSION

The incidence of neural tube defect in India is 4-5 per 1000 population, with certain populations having a significantly higher incidence based on genetic predilection. There is also a marked geographic variation in incidence. There are two fundamental theories regarding the embryogenesis of myelomeningocele, both encompassing a disorder of primary neurulation. In the so-called nonclosure theory initially suggested by Von Recklinghausen, it is proposed that neural tube defects represent a primary failure of neural tube closure. In the over distension theory, introduced in 1769 by Morgagni and popularized by Gardner, it is proposed that neural tube defects arise through over distension and rupture of a previously closed neural tube. The non-closure theory is more widely accepted and certainly accounts for the majority of human neural tube defects. Genetic factors do seem to have a role in some cases. Without treatment, historical data suggest that only 15% to 30% of myelomeningocele patients survive infancy. Current standards of care have improved the survival rate to approximately 85%, although approximately 10% will die before 6years of age, primarily due to complications from hindbrain dysfunction related to the presence of a symptomatic Chiari II malformation. Operative mortality is practically absent, while morbidity may be significant. The multidisciplinary team approach is critical to the ultimate success and long-term management of these patients. With proper medical care, children with open NTDs can lead active and productive lives.

CONCLUSION

Preconceptional and antenatal folic acid supplementation can make this a preventable disease. A thorough assessment of the craniospinal axis needs to be done to look for hydrocephalus, multiple tethering lesions and co existent cranial malformations, in addition to the apparent defect. Neurological deficits, orthopaedic anomalies, cardiac and gastrointestinal anomalies accompanying the spina bifida defect need to be addressed and managed appropriately. Significant improvement in motor and sensory function was not seen, but further deterioration in functional ability was curtailed by early surgical intervention. Long term follow up is needed regardless of initial surgical intervention , as a decline in function is a part of the natural history of this disease and requires early and appropriate diagnosis and treatment. A multidisciplinary approach is required to address this disease. Early diagnosis, surgical management and rehabilitation can prevent further neurological damage and can improve quality of life in patients with neural tube defects.

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