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REVIEW ARTICLE **OPEN ACCESS**

To Study the Impact of Spina Bifida among Children: A Review Study

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ABSTRACT
Spina bifida is one of the most common neural tube defect affecting the children. Its major cause is due to the deficient of folic acid during the gestational age. Spina bifida has major two component which are spina bifida cystica and occulta. Spina bifida cystic is the mildest form and the severe form is myelomeningiocele. Spina bifida can also lead to many neurological problems such as loss of bladder and bowel control. It can be prevented by early diagnosis and treatment during the gestational age and after delivery closure of the defect can be done to minimize the defects.
Key words: *spina bifida, myelomeningiocele, neurological defects*

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INTRODUCTION

Spina bifida, a malformation of the neural tube, affects both the meninges and the spinal cord. Spina bifida is a birth defect brought on by the neural tube's inability to develop to its maximum potential as a result of nutrient shortages during embryonic development. The spinal cord often grows throughout this period. It is divided into the following categories and appears in various forms:

1. SPINA BIFIDA OCULTA: It is both the most common and the mildest form of spina bifida .T he spinal cord and any surrounding nerves are normally unaffected in this situation. The spine may, however, have a minor defect, such as a hair tuft or a dimple-like structure surrounding the injured location. Most of the time, children do not exhibit any symptoms and lead normal lives. It can only be recognised by the imaging test. They don't require any surgeries.

2. MENINGIOCELE: A fluid sac develops in the baby's back in a rare form of spina bifida.
While some people may experience neurological issues, others may not.

3. MYEOLOMENINGIOCELE: The most severe form of spina bifida is the sac, which can appear in one or more places on the infant's back. The spinal cord and meninges are frequently involved in the sac. Amniotic fluid can now make contact with the sac..[1]

Fig 1: spina bifida adapted from Wikipedia

EPIDEMIOLOGY

- Neural tube defect is present in 1 out of 1000 live births.
- Increasing incidence is due to the frequent use of imaging test such as X RAY, MRI, CT scan etc

- Female to male ratio is 2:4
- Hispanic or whites have higher chances. [2]

CAUSES

- Other risk factors are use of medications such as anti epileptic medication or use of alcohol during pregnancy
- Other factors which contribute to spina bifida are maternal diabetic mellitus which is poorly managed, obesity etc.[3]

SYMPTOMS

SPINA BIFIDA OCCULTA:

- Typically there are not much visible symptoms as the nerves are not usually involved.
- Sometimes sighs on the newborn skin can be seen such as tufts of hair

MENINGOCELE:

- At the back, there is an exterior cystic defect.
- Meninges make up the entire sac, which is filled with CSF.
- The nerves and spinal cord are healthy.
- Leg weakness or a loss of sphincter control are rarely visible.. [4]

MYELOMENINGOCELE:

It is the severe form of spina bifida and the common features presented are as below

- A round, raised, poorly epithelial, herniated mass is present over the vertebral column mainly in the lumbosacral region
- Approximately 90 % of infants with severe spina bifida develop hydrocephalus due to associated Arnold chiari syndrome
- Loss of motor control and sensation occurs below level of lesion
- Bowel and bladder may or may not be affected and there may be fecal or urinary incontinence
- There may be renal impairment due to faulty renal innervations. UTI may be common
- Congenital skeletal anomalies may be present in these children due to denervation of muscles like club foot, developmental dysplasia of hip, kyphosis or scoliosis
- Developmental delays are commonly seen in speech, mobility , etc.

DIAGNOSIS

- Prenatal diagnosis of neural tube defects is possible by using following tests:
- Ultrasound
- Fetal MRI
- Amniocentesis: it may reveal an increase in alpha feto protein. This test should be done between 14 to 16th week of gestation in all pregnant females who are at risk.
- Diagnosis after birth is made on the following basis:
- On neonatal examination a sac may be seen on the back of the bay
- Is a lesion is present its content can be determined using transillumination test. If the sac becomes translucent when light source is held to it, it is a meningocele, if the sac does not become translucent, it is a meningocele
- CT scan MRI of spinal cord and brain are used to determine bony deformities and spinal cord herniation. They also help in diagnosing presence of other structural defects like hydrocephalus or Arnold chiari malformation.
- Laboratory test like urine test for presence of infection, renal function test , WBC count , ESR may be done
- Other test include neurological assessment of motor response and sensory reactions, developmental assessment to detect any delay in ,milestone etc. [6]

EFFECT ON THE QUALITY OF LIFE AMONG CHILDREN WITH SPINA BIFIDA

In a study by Choi et al., the quality of life of children with spinal bifida, as well as that of the children with spina bifida and their careers, was assessed, along with the status of bowel management in these children. Using a self-administered questionnaire, the bowel management status and quality of life of 173 spina bifida children were evaluated. Of the 173 children, 38 (22%) reported normal defecation, 73 (42.2%) reported constipation alone, and 62 (35.8%) reported faecal incontinence with or without constipation. According to study, the quality of life varied significantly depending on defecation symptoms. Therefore the children with spina bifida need assistance in terms of financial as well as support throughout their life.[7]

MANAGEMENT

The severity of spina bifida and its symptoms might vary from person to person, and so can the course of treatment. Treatment might not be required if there are no symptoms, as there are in the instance of spina bifida occulta.

For meningocele and myelomeningocele, surgery, specifically a laminectomy, is required, and the defect must be repaired or the sac removed within 24 to 48 hours of delivery before the skin graft is closed off. A coordinated multidisciplinary team approach is required for each impacted child to realise their full physical and intellectual potential. A group of specialists, including a neurologist, neurosurgeon, orthopaedic surgeon, urologist, general practitioner, nurse, speech therapist, and physiotherapy, must work together to manage the child..[8]

PREVENTION

The use of folic acid to prevent neural tube abnormalities, or NTDs, is a recent public health success.Folic acid-containing multivitamin supplements reduced the likelihood of NTD recurrence in women who had previously had an affected pregnancy. Currently, it is recommended that pregnant women at "high risk" who have a history of an NTD-affected pregnancy take 4 mg of folic acid before conception, while those at "low risk" are told to take 0.4 mg.... [9]

CONCLUSION

Spina bifida is a type of neurological disorder in which the neural tube is affected. It is caused mainly due to deficiency of folic acid in the diet during pregnancy. It has three types depending upon the clinical presentation mainly spina bifida occulta, meningiocele and myelomeningiocele. It can cause severe neurological deficit in the children and can affect their daily living activities. However it can be corrected by surgery in phase manner and it can also be prevented by dietary correction during the fetal stage.

CONFLICT OF INTEREST

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