

INCIDENCE AND COUTCOME OF PREGNANCIES WITH NEURAL TUBE DEFECTS IN HMC PESHAWAR

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ABSTRACT

Background: Neural tube defects are common and major birth defects that we see in our hospitals and community. Factors like geographic conditions, race, sex of the baby and certain maternal conditions affect the incidence of these defects. This study was carried out to assess the incidence and outcome of neural tube defects in Gynae-C Unit of Hayatabad Medical Complex, Peshawar.

Material and Methods: It was retrospective study of deliveries at Gynae C Unit of Hayatabad Medical Complex, Peshawar, from January 2013 to December 2013. Pregnant women delivering babies with Neural tube defects, both living and dead, were taken into consideration and made part of the study. Their antenatal and postnatal record was accessed and questionnaires filled accordingly.

Results: During the study period 3350 deliveries occurred, among which 18 were having neural tube defects. Out of these 8 fetuses had hydrocephalus, 3 had spina bifida with meningocele, 2 fetuses were anencephalic whereas 5 had multiple neural tube defects. During pregnancy the majority of neural tube defects i.e. 67% were diagnosed by ultrasonography. 72% of these ladies had spontaneous vaginal delivery, 11% had vaginal delivery after encephalocentesis and 6% had caesarean section. Main complication of the condition was polyhydramnios 78% and abruptio placentae 22%. Of 18 women with affected babies, none had taken folic acid in their first trimester.

Conclusion: Neural tube defects are common congenital anomalies in our set up. These can be prevented by health education of the mothers, regarding pregnancy and the nutritional requirements thereof. Thorough ante natal examinations can pick up most cases in early stages where management is easier.

Key Words: Neural tube defect, Hydrocephalus, Spina bifida, Meningocele, Anencephaly.

INTRODUCTION

Neural tube defects (NTDs) are common and major birth defects second in frequency only to congenital heart disease.¹ The incidence of different NTDs is highly variable depending on geographical location, ethnicity and gender. It is more common in Hispanic patients, in female fetuses, and in areas with low maternal folic acid intake.² Additional high risk groups include women with insulin dependent diabetes, obese women, women on anti convulsants, and women with folate or Vitamin B-12 deficiency.³

Overall birth prevalence of NTDs in the absence of antenatal diagnosis and selective abortion in UK is about 3-4 per 1000 births.⁴ The common embryologic origin may explain the concurrence of anencephaly with sacral spina bifida or complete non-closure of neural tube.⁵

Indian and Pakistani women residing in UK have significantly lower concentration of red cell folate.⁶ Serum B12 is also lower in pregnancies with neural tube defects.⁷

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Due to lack of balanced diet in Pakistan and especially Khyber Pakhtunkhwa the incidence of NTDs is quite high although no reliable statistics are available. Another misfortune is lack of any antenatal screening program, the purpose of which is to identify women who are at sufficiently high risk of having the abnormality.⁸

Hence majority of our patients are diagnosed either in labor or near term, since many such patients present with polyhydramnios. In successive pregnancies there is a high chance of recurrence of NTDs and proper preconception counseling is needed which normally is not done by healthcare providers in our setup. Routine screening by alpha feto protein (AFP) is usually no longer required but it remains an adjunct to ultrasonography when AFP is elevated but no defect is visualized by ultra sound.⁹ Most NTDs can be definitely diagnosed ultra sonographically as early as first trimester.¹⁰ Unfortunately in most peripheral health facilities this facility is not available.

The present study was conducted to find out the incidence of these defects on the basis of cases reporting in the Gynae C Unit of Hayatabad Medical Complex Peshawar.

METHODOLOGY

This study was carried out for one year, from January 2013 to December 2013, in Gynae-C Unit of Hayatabad Medical Complex, Peshawar, Pakistan. It

was a retrospective study of pregnancies affected by neural tube defects, from January 2013 to December 2013. Ante natal and post natal records of women carrying a neural tube defect fetus were accessed and data collected and information was recorded in questionnaire form. Information of risk factors like geographical location, folic acid intake, predisposing factors such as diabetes, obesity, use of any other drugs etc. was especially looked for from the records. Past history of neural tube defect pregnancy was taken into account. The type of neural tube defect and the outcome of the pregnancy were recorded.

RESULTS

Eighteen patients with neural tube defects were seen among 3350 deliveries during the study period, showing an incidence of 5.3 cases per 1000 deliveries. Among 18 affected fetuses 7 were males, 11 females. 8 fetuses had hydrocephalus, 3 had spina bifida with meningocele, and 2 had anencephaly while 5 had multiple neural tube defects. (Table-1).

During pregnancy majority of neural tube defects were diagnosed by ultrasonography in 12 cases and the rest 6 cases diagnosed after birth which shows that many of these cases are missed because of lack of knowledge and absence of reliable primary health care facilities. (Table-2)

Among 18 pregnant ladies with NTD fetuses, 2 were primigravida, 9 multigravida and 7 grand multigrav-

Table-1 Types of NTDs

No	Type of NTD	Numbers
1	Hydrocephalus	8
2	Spina bifida with Meningocele	3
3	Anencephaly	2
4	Multiple NTDs	5
	TOTAL	18

Table-2 Method of diagnosis

No	Diagnosis	Number
1	Ultrasound	12
2	After birth	6

Table-3 Associated Risk factors

No	Risk factors	Number
1	None	8
2	Consanguinity	2
3	Previous history of NTD pregnancy	1
4	Lower socio economic class	18
5	Intake of drug	2
6	Maternal age >40	16

Table-4 Method of delivery

No	Mode of delivery	Number
1	Spontaneous delivery	13
2	Normal Delivery with encephalocentesis	2
3	Breech Delivery	2
4	Caesarean Section	1

Table-5 Complications of NTDs

S.No	Complication	Number
1	Pregnancy induced hypertension	3
2	Placental abruptio	4
3	Polyhydramnios	14



Parity status of Cases

ida. 100% patients belonged to poor socio-economic class. Only 1 woman had previous history of a fetus with NTD and 2 had consanguineous marriage. Intake of teratogenic drug, sodium valporate was noted in 2 cases. Maternal age more than 40 years was seen in 16 patients. (Table-3)

13 patients had spontaneous vaginal delivery, 2 had vaginal delivery after encephalocentesis, 2 had breech delivery and obstructed hydrocephalic head which was drained vaginally or abdominally, and 1 patient had caesarean section due to Foetal distress. (Table-4)

Women who do not take folic acid are 8-9 times more prone to NTDs than those who take folic acid. Of the 18 pregnant women with NTD only one had taken folic acid and that too was after her antenatal booking at 20 weeks.

Complication rate was quite high in neural tube defect pregnancies; three patients had pregnancy induced hypertension, four had placental abruptio and fourteen had polyhydramnios. (Table-5)

DISCUSSION

The incidence of NTDs in our study was around

5.3 per 1000 deliveries, whereas in UK, USA, Denmark and Oman it is around 1-5 per 1000 deliveries.¹¹ This higher incidence in our study could be due to referral of complicated patients to our tertiary care hospital from all peripheral units, dietary deficiency of folate, multi-parity and consanguineous marriages. All these factors play some role in the high incidence.

Hydrocephalus accounts for 44% of all neural tube defects, 16% were spina bifida with meningocele, 11% fetuses were anencephalic while 28% fetuses had multiple neural tube defects. As far as age is concerned women with age more than 40 years besides other risk factors had higher chances of having neural tube defect babies.

Diet plays an important role as women from poor socio-economic class were more prone to have NTD babies.¹² In our study, 100% of patients were poor. This predisposition may be due to lack of proper diet, which may be deficient in folic acid. A survey was conducted in London where Indian and Pakistani women of child bearing age (16-50) had significantly lower concentration of red cell folate as compared to the general population.¹³ In our study none of the women had taken folic acid in the first trimester of pregnancy as a result the incidence of neural tube defects was found to be 5.3 per 1000 births.

The sensitivity of ultrasound screening overall is higher than maternal serum AFP screening being 86% versus 72% for all defects and 75% versus 64% for spina bifida. Primary ultrasound screening has 100% sensitivity for anencephaly while the sensitivity of serum screening is lower at 92%.¹⁴ AFP assay is not easily available everywhere in the province and across the country. More so the test is time consuming and expensive whereas Ultrasound is cost effective and gives accurate diagnosis immediately. A study has demonstrated lack of value in performing AFP measurement to evaluate pregnancies in third trimester.¹⁵

Complication rate was quite high in patients who presented with neural tube defects in emergency. Placental abruption was seen in 22% cases, which is a concomitant complication of hydramnios as 78% patients had polyhydramnios.

Intake of antiepileptic drugs such as carbamazepine or sodium valproate increases the risk of spina bifida by 1-1.5%.¹⁶ In our study 2 patients had history of intake of anti-epileptic drugs.

In our study 7 babies were male whereas 11 females showing a female preponderance of 1:1.6 over males. Similar findings were seen by other studies as well.¹⁷

CONCLUSION

Neural tube defects are quite common in Khyber Pakhtunkhwa. Chances of neural tube defects also

increase with advancing maternal age, poor socio-economic background and obesity. Preventive measures with provision of obstetric and health services, services for genetic information and risk evaluation, and folic acid supplements are important in developing and low-income countries.

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