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NEURAL TUBE DEFECTS;

PREVALENCE IN POPULATION OF RAHIM YAR KHAN

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ABSTRACT... Objective: To know the frequency of NTD among total births in teaching Hospital Rahim Yar Khan and to know the possible causes of neural tube defects in area of Rahim Yar Khan **Design:** Prospective study **Setting:** Department of Obstetrics and Gynaecology Sheikh Zayed Medical College/Hospital Rahim Yar Khan **Period:** One year from November 2006 to October 2007. **Patients &Methods:** All pregnant mothers were registered in the study but only those were selected who were diagnosed during pregnancy or after delivery as a case of NTD. **Results:** Out of 6701 live births, a total of 52 cases were diagnosed as NTD. The information was collected by taking history along with ultrasound findings and biochemical tests. The incidence came out is 7-8/1000 live births. The maternal mean age was 28.9 years and more common in primigravida i.e. 33% and 30% were grand multigravida. 75.3% of women belonged to low income group, and were not taking proper balanced diet. 80% lived in Joint family and 96.2% females were house wives. 96% cases of NTD were detected by ultrasound at mean gestation of 21.66 wks. The most common NTD was anencephaly found in 67% of cases, spina bifida 29% and encephalocele was found only in 4% of cases. The male; female ratio was 2:3. 74% of women had Hb level less then 10gm/dl and in 20 women the type of anaemia was macrocytic- hypochromic. **Conclusion:** Low socio-economic status, poverty and poor dietary habits may be factors for higher incidence of neural tube defects. Our study provides new data for the health care providers to improve health facilities and their utilization and iron and folic acid supplementation targeted to all women of child bearing age to prevent neural tube defects.

Key words: Neural tube defects, anencephaly, spina bifida.

INTRODUCTION

Structural abnormalities constitute the majority of congenital abnormalities encountered in clinical practice. Neural tube defects are among the most common major abnormalities[1].

There are two types of Neural tube defects. The most common type are Called Open Neural tube defects and other is closed NTD[2].

Neural tube closure occurs in the 3rd to 4th weeks after fertilization. Closure in the region of developing head and

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sacrum is completed approximately 24 and 26 days after conception respectively, Neural Tube Defects (NTD) most likely results from either a primary over growth of neural tube tissue with the line of closure, or a failure of induction by adjacent mesodermal tissues that interrupt closure[3]. Example of open NTDs are spina bifida (myelomeningocele), anencephaly and encephalocele. Rare types of NTDs are called closed NTDs, examples are lipomyelomeningocele, Lipomeningocele, and teethered cord[2]. Amongst the open neural tube defects Anencephaly is universally lethal while the prognosis of encephalocele is related to the size of the defect. Spina bifida usually effect the spinal cord at the caudal end, and its effects depends on the spinal level and number of spinal segments effected in the lesion.

Open neural tube defects are multifactorial in origin with well-defined environmental, genetic, pharmacological and geographical factors implicated[3].

Various screening methods are available for high risk women i.e. mid trimester maternal serum alpha-fetoprotein (AFP) level and amniocentesis for measurement of amniotic fluid AFP and detection of acetylecholinesterase (AchE) is usually no longer required. However, most ONTDs can be definitely diagnosed with high resolution Ultra sonography.

In Pakistan exact data for neural tube defects are not available. This study was designed to find out the prevalence and factors involving the occurrence of neural tube defects and suggest measures to overcome this problem.

PATIENTS AND METHOD

This study was carried out in the department of Obstetrics and Gynaecology Sheikh Zayed Medical College/Hospital Rahim Yar Khan. It was carried out over one year duration from November 2006 to October 2007. The study population comprised of mothers who were either diagnosed cases of neural tube defects by ultrasound or diagnosed after delivery. A pre-designed Performa was filled including the demographic data, marital status, education status, monthly family income and type of work, associated risk factors, past history of neural tube defects in siblings and also in family. Blood sugar level and Hb concentration was done in all study group women. Those who had Haemoglobin less than 10g/dl, peripheral smear was done to see the type of anaemia. After delivery gross examination of the neonate was done, detail of anomalies and the sex of neonate was noted.

Data entry and analysis was done utilizing software SPSS version 10.0 description analyses was done for frequency, mean, and standard deviation.

RESULTS

The prevalence of neural tube defects varies with different areas of population. In this study total 52 cases were detected out of 6701 live births (0.78%) i.e. 7-8/1000 live births. Which is higher than the incidence in U.K i.e. 1.5/1000[4]. In 52 cases of NTDs, maternal mean age was 28.9 years with SD 5.30 years. Which shows that NTDs more common in young age women. 37% (n=19) were multigravida (range G 2-4) and 17(33%) were Primigravida. 30% were grand multipara. In our culture one earning man supports the whole family, so 75.3% of women were belonged to low socio-economic group, their husbands were either farmers or labourers and 80% lived in Joint families and 96.2% females were house wives.

Anencephaly was the most common neural tube defect found in 67% (n=35) cases. Then the spina bifida is 29% (n=15). 29(55.7%) cases were detected during 2nd trimester (range 14-26 wks) and 19 (36.5%) cases were detected during 3rd trimester i.e. after 26 wks. The major tool for diagnosis was ultrasonography (n=48), only 4 cases were diagnosed after delivery. Regarding sex of the fetus male : female ratio was 2:3 which is comparable with other studies show NTDs are more common in female fetuses[5].

The Hemoglobin level of 10 g/dl was taken as lower limit of normal 38(74%) of women had Hb level < 10 g/dl, their blood was sent for peripheral smear and in 20 women the type of anaemia was macrocytic - hypochromic.

Table-I. General Characteristics of the Study Population		
Age (Years)	**No. of pts**	**%age**
15-20	11	21.15%
21-35	31	59.62%
>-35	10	19.23%
Parity		
P G	17	32.62%.
1 - 4	19	36.54%
> 4	16	30.77%
Husbands Occupation		
Govt Servant	6	11.54%
Private Servant	9	17.31%
Businessman	8	15.38
Farmer	14	26.92%
Labourer	15	28.85%
Occupational Status of Wives		
House wife	50	96.15%
Govt. Servant	2	3.85%
Family Status		
Joint Family	45	86.54%
Hb Concentration (gm/dl)		
7 - 8	8	15.38%
8 - 9	11	21.15%
9 - 10	19	36.54%
10 - 11	13	25%
11 - 12	1	1.92%
Peripheral smear		
Hypochromic & microcytics	28	53.85%
Macrocytic & Hypochromic	24	46.15%

Table-II. Characteristics of the Fetus		
Duration of pregnancy at diagnosis		
	No of pts	**%age**
Ist Trimester	4	7.69%
2nd Trimester	29	55.77%
3rd Trimester	19	36.54%
Types of neural defects		
Anencephaly	35	67.31%
Spina bifida	15	28.85%
Encephalocele	2	3.85%
Sex of the Fetus		
Male	22	42.31%
Female	30	57.69%

DISCUSSION

Open neural tube defects are the commonest structural congenital anomalies, its incidence varies because its causes are multi factorial, Occurs in approximately one in 1000 live births in the United States and U.K. and in present study it is 7-8 in 1000 live births. It is significantly higher than these developed countries. This hospital drains vast area of population i.e. lower Punjab, Balochistan and Sindh and majority of the population belong to low socioeconomic group. In this study 75.3% of women's husbands were either labourer or farmer and almost all study group females were house wives and 80% lived in Joint family system where one man supports the whole family.

Most countries had an official country- wide policy for routine ultrasound anomaly scanning. In our country there is no official policy for routine ultrasound anomaly scanning because of lack of expertise and also lack of awareness in population regarding anomaly scan at 18-22. Where as 55.7% of cases were detected during 2nd trimester (range 14-26 wks) which were incidentally diagnosed on ultrasound, in German registry area, 90% of NTDs were prenatally detected at median gestation of 18 wks[5].

Regarding the type of NTDs like in other studies anencephaly was the most common detected anomaly i.e. (n=35) and then was the spina bifida (n=15). In New-Zealand it is 0.98 & 1.02 per 1000 total births respectively[6]. NTDs were more common in female fetuses. Male: Female ratio was 2:3. Which is also comparable with text[7].

According to WHO the Hb level <11gm is called Anaemia[8]. In our country Hb level <10gm is called Anaemia. 74% of women were anaemic i.e. their haemoglobin level were less than 10 gm/dl and the most common type of anaemia was macrocytic hypochronic. This shows that poverty, lack of education and awareness are the major factors contributing the high prevalence rate of NTDs. In 1992 the U.K Department of health (DH) expert advisory group recommended that all women of child bearing age capable of becoming pregnancy consume 400 micrograms of folic acid to reduce the number of neural tube defects[9]. This gives insight to the health care provider, policy makers regarding general understanding of neural tube defects and provides health care facilities in rural areas.

CONCLUSION

Poor socioeconomic status, poverty, poor dietary habits and illiteracy leads to this higher incidence of neural tube defects in this area of population. The Use of supplements require a conscious effort on the part of women anticipating a pregnancy. Until and unless socioeconomic status and education will not improve, the incidence of neural tube defect could not be reduced.

Our study provides the new data under scoring the importance of public health intervention programmes of folic acid supplementation and food fortification targeted at all women of child bearing age to prevent neural tube defects.

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When in rage, drink cold water and lie down.

Shuja Tahir