Research Article

Neural tube defects – hospital based study in Hassan

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Abstract

Objective: Neural Tube Defects include anencephaly, spina bifida, hydrocephalus are the congential malformation with multiple etiology. This study will be helpful in planning strategies for prevention of neural tube defects. **Materials and Methods:** The study was carried on hospital based records from the period of Jan 2009 to Dec 2013. The defects are categorized based on domain anencephaly, spina bifida and hydrocephalus according standard definition. **Results:** During this period, 70 cases were detected with neural tubal defects. Out of 70 cases still birth was 42 and live birth were 28. The major lesion was anencephaly of all the neural tube defects. Approximately 2/3 cases were female. Average weight of anencephalic cases was less than 1000 gms. **Conclusion:** The significant difference in the prevalence between still birth and livebirth of NTD were noted. The periconceptional supplement of folic acid supplement is the possible strategy to reduce the defect.

Key Word: NTD-neural tube defects, AFP-alpha feoto protein, VIT-vitamin.

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INTRODUCTION

NTD is major congential anatomy estimated 3-7 % but actual number varies widely between countries[2]. The processes involved in the formation of neural plate, neural folds and closure of the folds to form neural tube by end of 4th week is called Neurulation[3]. NTD refer to any defect in Morphogenesis of neural tube the most common type of spina bifida, anencephaly and hydrocephalus. Spina bifida is associated with myelomeningocele or meningocele but approximately 95% of myelomenigocele is associated with hydrocephalus, paralysis of limbs depends on the level and extent of the lesion and also bladder storage and evacuation problems[4]. The most important nutrients in etiology of NTD are calories, fat, protein, folate, Zinc, Vitamins A, C, B6, B_{12}. Folate acts as Co-enzyme for several carbon transfer reaction synthesis of DNA, RNA and proteins. Folic acid is synthetic fully oxidized form of pteroylmonoglutamic acid present in supplement and does not occur naturally in significant quantities. Both Vit. B_{12} and Folic acid is required as cofactor transfer from Methyltetrahydrofolate to homocysteine, converting homocyteine to Methionine. The abnormalily in methionine synthase leads to accumulation of homocysteine, results in NTD affected pregnancy, The human neural tube closes about 4th post conception week therefore intake of folic acid supplement prior to and during this time plays major role in prevention of NTD[5].

MATERIAL AND METHODS

The data were collected from Hassan institute of medical sciences and Sir Chamarajendra hospital, Hassan, records for period of 5 yrs from 2009 to 2013 on NTD. The statistical analysis shows the retrosecptive study prevalence of NTD. The domain of Anencephaly are craniorachischisis, encephalocele and domain of spina bifida include Meningocele, Meningo-myclocele and rachischisis.

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RESULT

Table 1: Number of NTD's regarding the year occurrence from 2009-2013

Year	Anencephaly	Spina Bifida	Hydrocephalus	Total
2009	02	05	03	**10**
2010	10	03	05	**18**
2011	01	02	05	**08**
2012	08	04	02	**14**
2013	09	06	04	**20**

Table 2: Maternal age of 5 years interval grouping Rate of NTD's have been calculated in all age groups

Maternal age (years)	Anencephaly 31		Spina Bifida 20		Hydrocephalus 19	
<20	02	6.45	03	15	01	1.09
20-24	16	51.61	11	55	12	63.15
25-29	12	38.7	03	15	04	21.05
30-34	01	3.22	01	05	02	10.52
>35	00	00	02	10	00	00

Table 3: Categorizing the weights of cases into three groups. Rates of all types of NTD have been shown in weight groups

	Anencephaly 31		Spina Bifida 20		Hydrocephalus 19	
<1000	24	77.41	14	70	12	63.15
1000-2500	07	22.58	02	10	01	1.09
>2500	00	00	04	20	06	31.57

A total of 70 cases of NTD were detected among them 40% live birth and 60% still birth. The most common defect was anencephaly **31** cases, spina bifida **20** and hydrocephalus **19** cases. Regarding the type of NTD's,(this figure) anencephaly, spina bifida and hydrocephalus were 44.28%, 28.57%, and 27.14% respectively. Considering sex of cases **35** were female and **21** cases were male and sex of **4** cases was undetermined. Excluding unknown sex 53.03% were female. To find the association between the prevalence of NTD's and neonates weight their weight have been divided into 3 groups. With increasing neonatal weight NTD prevalence decreases.

DISCUSSION

The prevalence of NTD varies in different parts of world ranging from 3-7%. Out of 70 cases in 5 yrs period there was no history of intake of anti epileptic drugs and exposure to radiation. During the antenatal care 20 cases were detected by ultra sonography with NTD. One case of anencephaly was associated with consanguinous marriage. The percentage of various NTD was anencephaly (44.28%), spina bifida (28.57%) and hydrocephalus (27.14%). Anencephaly was associated with polyhydramnios (4), club foot (1), cardiac anamoly (1), myelomeningocele (1). Spina bifida was associated with hydrocephalus (7) and myelomeningocele (1). Hydrocephalus was associated with oligohydramnios (1) NTD in female newborn was more than male newborn with 53.03%. In this study, higher rate of neural tube defects was among newborn with low birth weight. The rate of neural tube defects was 71.42% (less than 1000g birth weight), 14.28% (birth weight between1000-2500g) and 14.28% (birth weight >2500g). In the maternal age group of 20 - 24 yrs, 39 cases (55.71%) of NTD were noted.

CONCLUSION

Maternal serum Screening for AFP can be indicated in the presence of neural tube defects. During pregnancy AFP is excreted in higher value than normal in NTD between 16-20 week of gestation done by amniocentesis with 1% risk of foetal loss. It is important for physicians prescribing retinoids for cystic acne which may have severe craniofacial and neural tube defects during child bearing age. The safest time to begin folic acid supplement (0.4-1 mg) in women who are planning for pregnancy is 3 months prior and upto 12th week of pregnancy which may reduce NTD.[5] The study definitely helps to know the pattern of congenital anomalies to plan the future strategies for prevention, early diagnosis and management.[2]

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