

**PREVALENCE OF NEURAL TUBE DEFECTS IN KIMS KARAD, 2012-2013  
EFFECTIVENESS AND IMPACT OF PRENATAL DIAGNOSIS**Sanjaykumar Patil<sup>1</sup>, Rajashree Bhosale<sup>2</sup>, Manisha Laddad<sup>3</sup>**HOW TO CITE THIS ARTICLE:**

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**ABSTRACT: OBJECTIVE:** To determine Prevalence of NEURAL TUBE DEFECT in tertiary care center (KIMS Karad) during July 2012-July 2013. **MATERIAL AND METHODS:** Patients referred to KIMS as NTD, Booked Patients diagnosed in KIMS as having neural tube defect based on ultrasound findings. **RESULTS:** Total prevalence of neural tube defect in KIMS from July 2012-July 2013 was 8.2/1000 births. Prevalence of different types of NTD-Anencephaly was 2.8 and spina bifida was 7.4. **CONCLUSION:** Aim of this study is to create awareness of NTD in order to prevent NTD by measures like periconceptional folic acid supplementation.

**KEYWORDS:** Neural tube defect, anencephaly, spina bifida, prevalence.

**INTRODUCTION:** Neural tube defect by definition is failure of neural tube to close during embryogenesis. Neural tube defect includes–spina bifida, anencephaly, encephalocele, craniorachischiss, inencephaly.<sup>1</sup> ANENCEPHALY–They lack variable amount of brain and cranium SPINA BIFIDA – They involve dysplasia of the spinal cord, neural roots and meninges. MENINGOCELE – Only sac protrudes without neural element. MENINGOMYELOCELE–The herniated sac contains neural element. ENCEPHALOCELE – This is a post closure NTD. Accompanying defects are Microcephaly and hydrocephalus. NTD is 2<sup>nd</sup> most common congenital anomaly.

Incidence of NTD varies from 1 to 10 per 10000 live births <sup>2</sup>. Prevalence differs by geographic area, socioeconomic status and ethnicity. Birth rate of infants affected by NTD has dropped in the last 30 – 40 years because of better prenatal diagnosis. Prenatal detection rates are reported to be in range of 82%-98%. Our study in KIMS conducted from 1<sup>st</sup> July 2012 – 30<sup>th</sup> June 2013 has showed 40 no of cases of Anencephaly and Spina bifida.

**OBJECTIVE:** To determine prevalence of NTD in tertiary care center (KIMS Karad) from 1<sup>st</sup> July 2012 to 30<sup>th</sup> June 2013. To determine effectiveness of prenatal screening for neural tube defects.

**METHODS:** At Krishna Institute of Medical Sciences Karad we had 4839 deliveries in period from 1<sup>st</sup> July 2012 to 30<sup>th</sup> June 2013. We included all NTD open or closed, whether occurring in isolation or with minor defects or together with other serious abnormalities or as per part of syndromes.

**STATISTICS:** All booked and unbooked cases were included.

- Total prevalence was calculated by dividing the total number of live births, still births affected by NTD by the total number of live births and still births for each year and expressing this as the rate per 1000 births.

## ORIGINAL ARTICLE

TOTAL BIRTHS	ANENCEPHALY		SPINA BIFIDA	
	Number	Prevalence	Number	prevalence
4839	14	2.8	36	7.4



WEEKS	ANENCEPHALY	SPINA BIFIDA
12-14	4	1
14-18	4	9
18-24	6	15
24-30		11

**TABLE NO. 1: CASES AS PER GESTATIONAL AGE AT DETECTION**

AGE (YEARS)	ANENCEPHALY	SPINA BIFIDA
<20	1	4
20-24	2	6
25-29	3	9
30-34	4	10
35 AND ABOVE	3	4
UNKNOWN	1	3

**TABLE NO. 2: ACCORDING TO MATERNAL AGE IN YEARS**

## ORIGINAL ARTICLE

BOOKED CASES	UNBOOKED CASES
28	12

**TABLE NO. 3: NUMBER OF ANTENATAL REGISTRATION**

TOTAL BIRTHS	PREVALENCE OF ANENCEPHALY	PREVALENCE OF SPINA BIFIDA	TOTAL PREVALENCE OF NTD PER 1000 LIVE BIRTHS
4839	2.8	7.4	8.2

**TABLE NO. 4: PREVALENCE**

**DISCUSSION:** This article is to create awareness of NTD and thus the need to prevent NTD by measures like preconceptional folic acid supplementation. A recent Cochrane review concluded that folic acid alone or in combination with vitamins and minerals prevents NTDs.<sup>3</sup> The etiology of NTD lie in epigenetics in vast majority of cases, one specific thermolabile variant, MTHFR C677T SNP, in which there is alanine to valine substitution, has been associated with a 66%-100% increase in the risk of NTD in their mothers,<sup>4</sup> especially those with low folate levels.<sup>5</sup> This mutation has been reported to account for 26% of Irish NTD's.<sup>6</sup>

They are multifactorial, maternal as well as paternal, but universally associated with environmental teratogens.<sup>7</sup> Good nutritional assessment and counseling is a critical component of preconceptional care.<sup>8</sup> Future research and multicentric, large – scale trials should be directed to epigenetic profiling of NTD. Folate pioneers had to overcome significant barriers on their path to discovery of that relationship and even more barriers to introduce the measures needed to prevent these birth defects.<sup>9-11</sup>

In our study at KIMS Total prevalence of NTD was 8.2/1000 births. In comparison with studies conducted at South Australia figures were comparable. During our antenatal OPD we perform USG at 11-13wks for nuchal thickness and subject patients for USG to rule out congenital anomalies at 18-24wks of gestation along with estimation of maternal serum alpha – fetoprotein levels in selected cases. Prenatal detection rate in our study was almost 99% only 4 cases were detected with NTD at birth, 3 were with meningocele and 1 was with spina bifida. All of them were unbooked patients.

**CONCLUSION:** Aim of this study is to create awareness of NTD in order to prevent NTD by measures like preconceptional folic acid supplementation. Etiologies lie in epigenetics in vast majority of cases. They are multifactorial, maternal as well as paternal but universally associated with environmental teratogens. Future research and multi centric large case trials should be directed to epigenetic profiling of NTD.

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