

Prevalence of Congenital Central Nervous System Malformations in 2nd Trimester of Pregnancy in Bahawal Victoria Hospital Bahawalpur on Gary Scale ultrasound

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Abstract

Objective: To evaluate the prevalence of congenital central nervous system (CNS) malformations in pregnant females coming to Radiology Department of Bahawal Victoria Hospital for antenatal ultrasonography in 2nd trimester.

Place and Duration: January 2017 to December 2017 in Radiology Department of Bahawal Victoria Hospital.

Study Design: Cross sectional study.

Materials and Methods: 215 pregnant ladies in 2nd trimester with fetuses having congenital central nervous system malformations on antenatal ultrasound were included in this study.

Results: Most common congenital CNS malformations with or without other associated defects were hydrocephalus (127 cases), Anencephaly (42) and myelomeningocele (30).

Conclusion: Hydrocephalus and anencephaly were the most prevalent CNS anomalies. Obstetric USG is cost effective and noninvasive investigation in detecting congenital anomalies

Keywords: Congenital Anomalies; Central Nervous System; Trimester

Introduction

The term malformation means any morphological abnormality of the CNS that dates to the embryonic or fetal period, regardless of the mechanism of its origin [1]. Globally, the incidence of congenital anomalies has been shown to vary from one geographical region to another, affecting about 3 - 7% of all newborns [2]. In most cases reported, CNS anomalies appear to be the most common systemic congenital anomalies. Majority of the causes of congenital anomalies is uncertain. Neural tube defects (NTDs) account for the most congenital anomalies of the central nervous system (CNS) and result from failure of the neural tube to close spontaneously between the 3rd and 4th week of embryonic development [3,4]. Major neural tube defects include meningocele, myelomeningocele and encephalocele. Other common CNS abnormalities are hydrocephalus, Anencephaly, corpus callosum agenesis, holoprosencephaly, Dandy-Walker, Arnold-Chiari, hydranencephaly and arachnoid cyst [5].

Second trimester ultrasound scan is integral part of antenatal care. In cases where a major structural defect is identified termination of pregnancy is advised to reduced post-natal morbidity and mortality [6]. Main object of our study was to diagnose CNS anomalies as early as possible to avoid mental trauma, agony and financial stress of carrying handicapped child on family.

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Materials and Methods

This was a cross sectional study. 215 pregnant females coming to Radiology Department of Bahawal Victoria Hospital for antenatal ultrasonography in 2nd trimester and having fetuses with positive CNS anomalies were included in study. All cases were recruited in study under informed consent. Data collection was done using questionnaire designed for the study. The diagnoses of the CNS anomalies were based on ultrasound findings. Patient’s history included maternal age, paternal age, gestational age, history of exposure to teratogens and family history of consanguinity (first cousins) and birth defects (in siblings, up to second and in some few cases third generation pedigree). The prevalence rate was estimated as a percent of the total number of antenatal ultrasounds showing CNS abnormalities.

Results

There were a total of 215 pregnant women enrolled in this study. Mean age of the mother in this study population was 24.5 years (18 - 34 years). Mean age of father was 41 years (34 - 48 years). Out of 215 patients 123 (57.2%) gave history of interfamily marriage while 92 (42.7%) gave history of out of family marriage. Only 6 (2.8%) out of 215 patients gave positive history of congenital CNS abnormalities in siblings, most prevalent was hydrocephalus. None of patients gave history of teratogen intake.

Percentage of congenital CNS Malformations on ultrasound in 2nd trimester.

| Serial no | CNS Abnormality | Total No (215) | Percentage % |
|-----------|-----------------------------|----------------|--------------|
| 1. | Hydrocephalus | 127 | 59% |
| 2. | Anencephaly | 42 | 19.5% |
| 3. | Meningomyelocele | 30 | 13.9% |
| 4. | Arnold Chiari Malformation | 10 | 4.6% |
| 5. | Agenesis of Corpus Callosum | 3 | 1.4% |
| 6. | Dandy walker Malformation | 2 | 0.9% |
| 7. | Holoprosencephaly | 1 | 0.46% |

In our study most prevalent CNS malformation was hydrocephalus followed by anencephaly.

Discussion

Routine grey scale trans abdominal ultrasound has made it possible to detect birth defects antenatally. CNS anomalies are either incompatible with life or are life limiting making a child bedridden and disabled for the rest of life [7,8]. Most common anomaly encountered in our study was hydrocephalus. Study carried out in North Clinic Istanbul showed Chiari malformation is most prevalent anomaly in that area [9]. Another study carried out in Iran in 2011 on 22500 pregnant ladies shows most prevalent CNS malformations are Chiari malformation and hydrocephalus [10]. While study carried out in India in 2014 shows most prevalent CNS anomaly was Anencephaly [11]. A study carried out in KPK in 2017 also showed prevalence of Anencephaly in that region [12]. In our study hydrocephalus (59%) was the most prevalent followed by anencephaly?

Conclusion

Early detection of CNS related congenital anomalies is a key point to reduced mortality and morbidity in new born. Timely hospital visits along with well in time antenatal anomaly scan is essential for early detection of anomalies. Ultrasound is the most readily avail-

able, cost effective and reliable method for detection of anomalies. Decision of termination of pregnancy lies with the couple. In our area hydrocephalus is the most prevalent type of CNS related anomaly with or with other anomalies.

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