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Determination of Mean Fetal Lateral Ventricle Diameter in Pregnant Patients of Consanguineous and Non Consanguineous Marriages

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Abstract: Evaluation of the lateral ventricle in second trimester is an important indicator for normal brain development. We sought to analyze the difference in the mean fetal lateral ventricle in second trimester among the consanguineous and non-consanguineous marriages in Indian population, in this retrospective cross sectional study. Study was carried out in the Department of Radiology, Sree Balaji Medical College and Hospital, Chennai, from June 2017 – June 2018. A total of 1067 patients in their second trimester (18 – 24 weeks of gestation) were included in this study (740 Non consanguineous and 327 consanguineous marriages). Lateral ventricle measured in true symmetrical axial plane at the atria of lateral ventricle and glomus of choroid plexus, opposite to the parieto occipital sulcus. Mean lateral ventricle dimension was 6.40 mm in consanguineous marriages and 6.42 mm in non consanguineous marriages. There is no significant difference in mean lateral ventricle size in consanguineous marriages and non consanguineous marriages at this period of gestation.

Keywords: Lateral ventricles, atrium, Ventriculomegaly, Consanguineous Marriages.

INTRODUCTION

A great deal of attention has been given to the measurement of fetal lateral ventricular diameter as a pivotal finding in the diagnosis of CNS pathologies [1-3]. Measuring the atrium of fetal lateral ventricle is a sensitive method for determining ventricular size. It is also the earliest ultrasonographic indicator capable of detecting trivial changes in ventricular dilatation in the fetal brain. If the atrial measurements fall within definite ranges of ventriculomegaly, it is crucial to search for the potential underlying causes.

Managing this condition and counseling expectant mothers with fetuses that show symptoms of ventriculomegaly during early second trimester are difficult, because the causes, absolute risk, and degree of resulting handicap cannot be confidently determined at this period of gestation [4].

Ventriculomegaly has a significant adverse effect on fetal outcome; it may be associated with other congenital anomalies [5] and has a prevalence of 0.3–22 per 1,000 live births [6]. Previously established cut-off values of fetal cerebral lateral ventricles (FCLVs) dimensions are: normal (< 10mm), mild/borderline VM (10–12 mm), moderate VM (13–15 mm), and severe VM (> 15 mm) [7]. Accurate measurement of lateral ventricle is of utmost importance and significant in assessing the prenatal diagnosis.

Many studies have been conducted to evaluate the fetal lateral ventricular measurements [8-11] . This study was conducted to evaluate the accuracy of normal lateral ventricle diameter and to compare it with both consanguineous and non consanguineous group patients.

MATERIALS AND METHODS

A total of 1067 pregnant patients in their second trimester (18 – 24 weeks of gestation) were included in this study with history of non consanguineous marriage in 740 patients and consanguineous marriages in 327 patients. The Study was conducted from june 2017 till june 2018 for the pregnant women referred for second trimester ultrasonography to our Department Of Radiology , Sree Balaji Medical College And Hospital, Chennai**,** after getting their written informed consent. Lateral ventricle measured in true symmetrical axial plane at the atria of lateral ventricle and glomus of choroid plexus, opposite to the parieto occipital sulcus. Calipers placed touching the inner edge of the ventricle wall at its widest part, aligned perpendicular to the long axis of the ventricle [2].

Sonographic estimation of fetal lateral ventricle is an important tool for obstetrical decision

making in management of delivery. In this study we emphasize on the fetal lateral ventricle diameter in second trimester (18 – 24 Weeks of gestation) among our patients with the history of both consanguineous and non-consanguineous marriages and its efficacy and reliability.

Ultrasonographic evaluation was done in all patients IN THEIR SECOND TRIMESTER (18 – 24 Weeks of gestation) using SIEMENS ACUSON S 2000, 3.5 MHz convex array transducer. Exclusion criteria were: known abnormal growth or karyotype, congenital malformations and multiple pregnancies. Institute Ethical committee permission was obtained.

STATISTICAL ANALYSIS

The measured values were analyzed statistically using Microsoft Excel Statistical package. The measured values were used to compare the results between the two groups of patients that we have taken for this study. Normograms were derived by taking 25th, 50th and 75th percentile values in all patients. The mean fetal lateral ventricle values between the two groups are compared for any significant difference. The comparative statistical analysis was given below

Table-I: shows Mean Lateral Ventricle measurement by Marriages

Type of marriages			Lateral ventricle size
Consanguineous marriage	Mean		6.4006
	Std. Deviation		.57162
	Percentiles	25	6.0000
		50	6.0000
		75	7.0000
Non consanguineous marriage	N	Valid	740
		Missing	0
	Mean		6.4216
	Std. Deviation		.57279
	Percentiles	25	6.0000
		50	6.0000
		75	7.0000

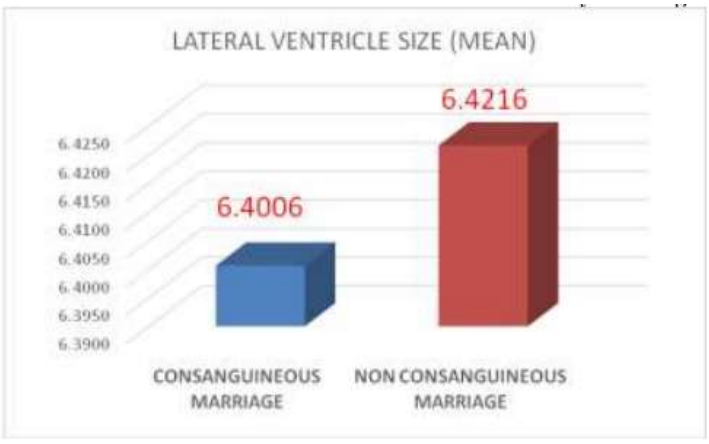

Fig-I: shows Mean Lateral Ventricle measurement by Marriages

RESULTS AND DISCUSSION

A thorough knowledge about the fetal lateral ventricle size and detection of ventricular dilatation is a critical part of the routine obstetric examination, because of its clinical significance and is required for better management and timing of delivery in obstetric care [12, 13]. The accurate recognition of ventricular abnormalities relies on a precise understanding of the normal range of sizes. Many methodologies have been put forth to measure the lateral ventricles [18, 19]. In our study, Lateral ventricle measured in true symmetrical axial plane at the atria of lateral ventricle and glomus of choroid plexus, opposite to the parieto occipital sulcus. Calipers placed touching the inner edge of the ventricle wall at its widest part, aligned perpendicular to the long axis of the ventricle.

Fetal Ventriculomegaly can be isolated or associated with other congenital anomalies [14]. Isolated fetal ventriculomegaly is the most common cerebral anomaly detected during routine prenatal pregnancy scans [15] and is a significant risk factor for developmental delay in children. It is important to visualize both the lateral ventricles in order not to miss findings of bilateral VM [16]. Ventriculomegaly is an indicator of poor fetal outcome; thus, it is important to establish and understand the normal variations of the cerebral ventricular parameters [17].

Consanguinity leads to more prevalence of congenital malformations [20, 21]. Ventriculomegaly represents a range of pathologic conditions from isolated mild ventriculomegaly to the dismal situation of hydrocephalus with associated defects. It may result from chromosomal and genetic defects, brain abnormalities, hemorrhage, infection or unclear etiological cause.

Our results also showed that the mean fetal lateral ventricle diameter (Table I and II) is not affected by the consanguity of marriage as the MEAN Diameter was 6.40 mm in consanguineous marriages and 6.42 mm in non consanguineous marriages and there was no significant difference.

CONCLUSION

Evaluation of the cerebral ventricular system is a routine investigation of all fetal Sonographic examinations. A thorough knowledge about the standardization of the measurement of lateral ventricles must be the first and pivotal step. Several scientific studies have shown that consanguinity leads to increased incidence of genetic and congenital anomalies [22, 23]. Our results also showed that mean fetal lateral ventricle diameter is not affected by the consanguity of marriage at this period of gestation as the Mean diameter was 6.40 mm in consanguineous marriages and 6.42 mm in non consanguineous marriages and there was no significant difference.

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