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Neurodevelopmental outcome in fetuses with isolated mild ventriculomegaly

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Objective

The aim of our study was to assess the postnatal outcome in pregnancies with isolated fetal Mild Ventriculomegaly (MVM) diagnosed at the 18-24 weeks' scan in a "limited resource setting".

Methods

This is a single centre retrospective study of prospectively collected data conducted at a tertiary fetal care centre in South India. The study period was from January 2010 till December 2021. All singleton pregnancies with fetal cerebral ventricle measurement more than or equal to 10mm (ventriculomegaly, VM) and less than 15mm at 18^{+0} – 24^{+0} weeks' scan were studied. The cerebral ventricles were measured in the axial view of the transventricular plane at the level of parieto-occipital fissure with calliper placement from inner to the inner border. The proximal ventricle was also measured in all fetuses as per the unit protocol. Fetuses that had associated chromosomal and non-chromosomal (intra and extra cranial) anomalies were excluded. Only live births that had antenatally detected isolated MVM were included for postnatal evaluation. All scans were performed by FMF certified operators for the 18 – 24 weeks' scan. All examinations were recorded on the Astraia fetal database software. Parents were interviewed telephonically as per the questionnaire on Developmental milestone by Centre for Disease Control and Prevention (CDC) for evaluation of postnatal neurodevelopment according to the age of the child. The data was analyzed on chi- square test to assess the significance.

Results

77 live births that were detected to have MVM antenatally were evaluated postnatally by telephonic interview as per the CDC guidance for neurodevelopment of the child. 63/77 (81.8%) of these were unilateral and 14 (18.1%) were bilateral MVM. There was 1/14 (7.1%) neonatal death within 4 days of birth in the bilateral MVM group that was detected to have fetal overgrowth syndrome antenatally. The 3rd trimester findings of these 77 fetuses were further studied to assess for any progression - 3/77 (3.9%), regression - 41/77 (53.2%) or stable - 12/77 (15.5%). Follow up scans were performed in other unit in 21/77(27.2%) and hence, there is no information for these in the 3rd trimester. We have neuro-developmental follow up in 48/77 (62.3%) babies ranging from 8 months to 11 years. 40/48 (83.3%) had unilateral MVM and 8/48 (16.6%) had bilateral MVM. There was neurodevelopmental delay seen in 2/40 (5.1%) (2 boys, aged 3,4 years) and 1/8 (12.5%) (6-year boy) in unilateral and bilateral cases respectively. In utero, out of 3 babies with neurodevelopmental delay, 1/3 (33.3%) had regression in the size of ventricles and 2 (66.6%) had follow up scan done elsewhere and hence the 3rd trimester finding was not available for the size of the ventricles.

Conclusion

Fetal MVM continues to be a counselling challenge in the absence of associated chromosomal and non-chromosomal anomalies. The incidence of neurodevelopmental delay in isolated unilateral VM is relatively lesser than the bilateral group, but this difference is not significant. (p value =0.488; NS). However, this is more than what is a seen in the "normal ventricular size" group. Follow-up ultrasound examination might be helpful to assess for progression of the size of ventricles and for any other pointers to possible poor neurological outcomes. Larger multicentric studies are needed to ascertain the risk of neurodevelopmental delay in fetuses with unilateral VM and the possible risk factors that might influence the postnatal prognosis. The limitation of our study is largely due to the limited resources in our setting and majority of the fetuses did not have an MRI scan to evaluate for any subtle intracranial findings especially in the 3rd trimester. In addition, nearly 27.3% of the fetuses were scanned in other units and hence the third trimester follow up findings could not be verified.

ID:4084 **Table 1-In utero and Neurodevelopmental outcome in isolated Mild Ventriculomegaly (VM)**

Total Live births Isolated Mild VM-77 Neurodevelopmental outcome n-48/77(62.3%)	Unilateral VM 40/48(83.3%)				Bilateral VM 8/48 (16.6%)			
	Progressive	Regress	Stable	No follow up scan	Progressive	Regress	Stable	No follow up scan
	1/40 (2.5%)	24/40 (60%)	7/40 (17.5%)	8/40 (20%)	0	4/8 (50%)	1/8 (12.5%)	3/8 (37.5%)
Neurodevelopmental outcome Normal	1	23/24 (95.8%)	7/7	7/8 (87.5%)	0	4/4	1	2/3 (66.6%)
Neurodevelopmental outcome Normal Abnormal	0	1/24 (4.2%)	0	1/8 (12.5%)	0	0	0	1/3 (33.3%)
P value for Neurodevelopmental outcome =0.488; Not Significant								

(ID:4084) -Images showing cerebral ventriculomegaly