SUMMARY AND CONCLUSION
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Sonography and Ultra fast MRI have been the modalities to assess fetal anomalies. Sometimes doubts exist even after routine USG and Conventional MRI. Our study evaluated the contribution of MR Signal intensity measurement in diagnosis of fetal central nervous system anomalies. Signal intensity depends on the tissue, myelin and water content.

MR imaging was performed on 110 fetuses antenatally. Only 101 could be taken up for the SIR study as 9 had destroyed brain. 51 of them had normal CNS and were used as controls. Signal intensity measurements were obtained from transverse images at the designated areas and the SIR was calculated. The SIR obtained from fetuses having CNS abnormalities were compared with that of controls.

Vermis SIR values < 0.70 had 78 % sensitivity and 100% specificity towards normalcy in the appropriate clinical set up. Periventricular values < 0.70 had 99 % sensitivity and 100% specificity towards normalcy in the appropriate clinical set up. Genu of Corpus callosum SIR Values < 0.70 had 89 % sensitivity and 100% specificity towards normalcy.

In hydrocephalus, the SIR of cerebellar vermis and periventricular region was higher than controls. Vermis SIR values > 0.75 had 87 % sensitivity and 99% specificity towards hydrocephalus in the appropriate clinical set up.
Periventricular values > 0.75 had 89% sensitivity and 99% specificity towards hydrocephalus in the appropriate clinical set up

In ACM 2 the SIR of cerebellar vermis and periventricular region was higher than controls. Vermian SIR Values > 0.75 had 86% sensitivity and 97% specificity towards Arnold Chiari malformation in the appropriate clinical set up. Periventricular Values > 0.75 had 86% sensitivity and 95% specificity towards Arnold Chiari malformation in the appropriate clinical set up

The SIR of genu of corpus callosum in PACC was higher than controls. Genu of Corpus callosum SIR Values > 0.75 had 80% sensitivity and 100% specificity towards PACC in the appropriate clinical set up

In ventriculomegaly (nonprogressive, isolated) the SIR were similar to controls. In fetuses with other CNS anomalies like arachnoid cyst, mega-cisterna magna and meningomyelocele the SIR were similar to that of controls. In schizencephaly the SIR of the edges were similar to grey matter. Thus quantitative SIR measurements have a role in diagnosis of certain fetal CNS abnormalities

US vs MRI:

In the 110 fetuses studied, a total of 104 anomalies were encountered on sonography. 14 fetuses were normal. The MR images were then read by a radiologist who was blinded to the US data but was however told that the region of interest was (1) head-neck or (2) trunk or (3) both. Out of the 104
anomalies, confident diagnosis could be made by MR imaging in 98 anomalies (94%); wrongly/ not diagnosed in 6 (6%). By US, confident diagnosis could be made in 81 anomalies (78 %), suspected in 15(14%) and wrongly/ not diagnosed in 8 (8%). In the evaluation of CNS and thoracic anomalies, more number of confident diagnoses could be obtained by MR imaging as compared to US. In the detection of gastrointestinal and genitourinary anomalies there was no significant difference between the two modalities

Conclusions:

Signal intensity measurement is useful to differentiate physiological and isolated non progressive ventriculomegaly from ACM-2 and hydrocephalus fetuses. This will help in counseling especially in borderline cases. In cases of hydrocephalus, it is useful in predicting the level of obstruction.

It is also useful in the diagnosis of Partial agenesis of corpus callosum, schizencephaly with possible role in grey matter heterotopias. This information will be valuable in counseling the patient and for further management.

US is the primary modality in the assessment of fetal anomalies. Limitations in US necessitate the use of MR imaging as a complementary tool. MR imaging adds valuable information in the evaluation of anomalies especially those of CNS and thorax.
**Future directions**

Further studies based on SIR can be directed towards dysmyelinating diseases, metabolic disorders, fetal CNS infections where signal intensity measurement can show the changes earlier. SIR in Partial agenesis of corpus callosum to be studied in a larger population.