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Original Article

Radiology Section

Accuracy of Two-dimensional Ultrasound and Magnetic Resonance Imaging in Diagnosis of Foetal Congenital Anomalies in a Tertiary Care Hospital- A Cross-sectional Study

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ABSTRACT

Introduction: Ultrasound screening for foetus congenital malformations is the mainstay in diagnosis and is commonly performed at 19-22 weeks gestation. Magnetic Resonance Imaging (MRI) is known as a problem solving tool which is used for answering a specific question. Both ultrasound and foetus MRI are highly sensitive and specific in diagnosis of congenital anomalies of the foetus with high agreement between both modalities.

Aim: To determine the accuracy of Ultrasound Sonography (USG) and High Field 3 tesla MRI in diagnosis of different types of foetal Central Nervous System (CNS) and non CNS congenital abnormalities.

Materials and Methods: A cross-sectional study was conducted in the Department of Radiodiagnosis at Agartala Government Medical College and GB Pant Hospital from June 2017 to May 2019. A total of 65 cases with ultrasound diagnosis of foetus abnormalities were examined by 3 Tesla MRI. MRI were performed within 15 days after USG detected anomalies. Statistical analysis was done using Chi-square test.

Results: In cases with foetus anomalies high field MRI provided detailed findings leading to a more refined diagnosis. CNS anomalies were more as compared to other anomalies. Some of the antenatal findings were confirmed in some cases following termination of pregnancy and some were by postnatal examination. Among them chest anomalies was least common i.e., 1.5%. sensitivity of MRI was 88.13%, specificity was 66.66%, Positive Pressure Ventilation (PPV) was 96.29%, Negative Predictive Value (NPV) was 36.36% and USG sensitivity was 82.43%, specificity and 77.77%, PPV was 95.83%and NPV was 41.17%.

Conclusion: High field MRI should be used as a second line of investigation in patients with foetus abnormalities diagnosed by ultrasound for confirmation of diagnosis and selecting the treatment protocol. In cases of fatal abnormalities, a confirmed diagnosis made before 20 weeks of pregnancy may help by terminating the pregnancy.

Keywords: Cardiovascular system malformation, Central nervous system malformation, Gestational age, Postnatal, Prenatal

INTRODUCTION

As per the WHO fact-sheet of October 2012, congenital anomalies can be defined as structural or functional anomalies, including metabolic disorders, which are present at the time of birth [1].

An approximately 303,000 neonatal deaths occur globally each year due to congenital malformations [2]. The prevalence rate of congenital anomalies in India is 6-7%, CVS anomalies followed by CNS anomalies. According to March of Dimes global report congenital foetus malformations are encountered in about 6% of all births [3].

Ultrasound is the most important modality to evaluate the foetus. The excellence of ultrasound however, is unfavourably exaggerated by factors such as maternal obesity, unfavourable foetus position, decreased amniotic fluid or the near-field reverberation artifact [4].

Foetus MRI can corroborate doubtful ultrasound findings and thus add assurance in a meticulous prenatal diagnosis before performing interventional measures [5]. In vivo foetus MRI is the accurate adjunct tool to ultrasound, to characterise brain malformation, to identify different causes responsible for brain damage, and to document mechanisms responsible for brain injury and their consequences on the developing brain [6]. In about 60% of cases the aetiology of cerebral malformation remains unknown. MRI adds important additional information, particularly in foetuses in whom additional findings other than an enlarged ventricle are seen sonographically [7].

The American College of Radiology (ACR) has stated that foetus MRI can be performed at any stage of pregnancy [8]. However, it is better to perform the MRI after 17-18 weeks of gestation, as there is a possible risk to the developing foetus as well as the extreme motion of younger foetus does not let us to carry out an MRI examination [9,10]. The present study was carried out with aim to determine the sensitivity, specificity, positive predictive value and negative predictive value of ultrasonography and Magnetic Resonance Imaging (MRI) in foetus congenital anomalies in tertiary care teaching hospital.

MATERIALS AND METHODS

A cross-sectional study was conducted in the Department of Radiodiagnosis at Agartala Government Medical College and GB Pant Hospital, Tripura, India from June 2017 to May 2019. This study was approved by the local scientific review board Committee as per Ref No. F.4 (5-244)/AGMC/Academic/IEC certificate/21/7057. An informed written consent was obtained from each participant.

All the pregnant women attending the USG at Radiodiagnosis Department of AGMC and GBP Hospital and were diagnosed to have foetus structural anomalies were included and all these cases were examined by 2D ultrasound and underwent MR imaging within one week were the target population.

Inclusion criteria: All the clinically suspected patients diagnosed to have congenital anomaly from 14-33 weeks Gestational Age (GA) by ultrasound were included in the study.

Exclusion criteria: Patients contraindicated for MRI examination; patients not willing to do the study. Late trimester anomalies which were more tough on USG, also twins, polyhydramnios. Pateints in the late trimester of pregnency were excluded.

Study Procedure

Detailed medical and obstetrical history was taken followed by clinical examination. Ultrasound were performed by Medison Sonoace X8 or Siemens Accuson 2000 machine using convex abdominal probes and/or volume probe using transverse, coronal and sagittal planes and additional views as needed with use of colour Doppler sonography. MRI was done by Siemens Magnetom Skyra 3T system. Mothers fasted four hours before the examination to reduce bowel peristalsis and to reduce postprandial foetus motion. Patient were asked to empty the urinary bladder prior to the examination and made to lie supine during the examination. Foetus MRI was done using single slice fast spin echo (HASTE) and gradient echo sequence (TRUFI) in various planes. Contrast was not used in MRI and MRI protocol was given [Table/Fig-1].

Parameter	HASTE	TRUFI
Repetion time/Time to echo (ms)	1400/92	762.78/1.85
Field-of-view (FOV) (mm)	400	377
Matrix	256×256	256×256
Slice thickness/Interslice gap (mm)	4/0.8	3/0.5

[Table/Fig-1]: MRI protocol.

The diagnoses obtained by sonography and MRI were collected and compared. Both of them were compared with the final diagnosis when available by termination or postnatal evaluation. Postnatal imaging tests were performed only when clinically indicated. Postnatal examination, autopsy and postnatal MR imaging results were the gold standard for the evaluation of the accuracy of either modality.

STATISTICAL ANALYSIS

The data was entered in master chart and proportion, mean, standard deviation and other statistical tests was applied as per necessity and analysed using appropriate statistical software e.g., Statistical Package for the Social Sciences (SPSS) version 16.0 statistical package and Chi-square test was used to compare the sensitivity of Thermo-Acoustic Ultrasound (TAUS) and MRI scan with level of significance of <0.05.

RESULTS

In this study mean±SD Gestation Age (GA) was 22.50±4.9 weeks, mean maternal age was 28 years±7.1, among them <30 years (57%) was the most common and most common gravida was 2nd gravida (43%) followed by primigravida (32%). Around 45% risk factor were seen among elderly primigravida, multiple gestation, history of down syndrome and unexpected pregnancy loss [Table/Fig-2].

Variables	N	%
Maternal age (Years)		
30 or <30	37	57%
>30	28	43%
Gestational age at diagnosis		
1st trimester	11	17%
2nd trimester	34	52%
3rd trimester	20	31%
Risk factors		
Present	29	45%
Absent	36	55%
Foetus sex		
Male	34	52%
Female	31	48%
Parity		
G1	21	32%
G2	28	43%
G3	16	25%

[Table/Fig-2]: Demographic presentation of the subjects.

A total of 65 cases were examined. Out of the total cases 21 cases were seen to have only CNS anomalies, two cases with both CNS and other anomalies, [Table/Fig-3,4]. Mean MR imaging time was 11±1.19 minutes in our study compared to 27±1.74 minutes for USG study.

System (n=65)	Major anomaly n=55 (84.6%)	Minor anomaly n=10 (15.3%)
CNS anomalies (21)	18 (27%)	3 (5%)
CVS anomalies (12)	10 (15%)	2 (3%)
GIT anomalies (10)	9 (14%)	1 (1.5%)
GU anomalies (10)	8 (12%)	2 (3%)
MSK anomalies (5)	4 (6%)	1 (1.5%)
Chest anomalies (5)	4 (6%)	1 (1.5%)
Head and neck anomalies (2)	2 (3%)	0 (0)

[Table/Fig-3]: Distribution of anomalies in each system (No. of patients).
CNS: Central nervous system; CVS: Cardiovascular system; GIT: Gastrointestinal; GU: Genitourinary; MSK: Musculoskeletal abnormalities

For most of the cases diagnosed both by USG and MRI, a complex set of different abnormalities were detected. For example in corpus callosal agenesis comprises at least 8-10 different findings. Similarly a case of hypolastic left heart syndrome may have 4-5 different findings. True strength of imaging modalities depends upon the ability to detect the number of abnormalities present in the foetus. Although the diagnosis of an anomaly can be made after detection of a few findings, a large number of findings may remain undetected by the imaging modality. Hence, calculation of the number of abnormalties detected by the imaging modality is more important than the number of foetus with congenital anomaly. This study is designed to calculate the number of anomalies rather than number of foetuses.

Evaluation of CNS Anomalies

Among CNS anomalies Complete (number 1) and partial (number 1) agenesis of corpus callosum were diagnosed by ultrasound but MRI provided additional information which were not visualised by USG [Table/Fig-5]. Encephalocele was seen in two cases which on USG showed large part of the brain protruding through the calvarial defect and on MRI vividly depicts the frontal and occipital encephalocele. MRI provided the exact localisation of the defect and extent of the disease [Table/Fig-6].

One case of vein of galen malformation was diagnosed by USG. Right ventricular dilatation, and CCF was not visualised properly by MRI but were visualised well by USG. Measurement of cardiac output was possible only by USG [Table /Fig-7].

Hydranencephaly was seen in one case which on USG showed grossly dilated lateral ventricles, unfused thalami, midline falx, cerebellum, two vessel umbilical cord, on MRI normal cerebral aqeuduct, fourth ventricle, midline falx and unfused thalami was clearly seen. Hence, both USG and MRI provided similar information of Hydranencephaly [Table/Fig-8].

Dandy walker malformation was seen in one case which seen as posterior fossa cystic mass, gross hydrocephalus and hypoplastic cerebellum on USG. On MRI, showed cystic dilatation of fourth ventricle, tentorial elevation, vermian aplasia and severe obstructive hydrocephalus. MRI was able to detect most of the brain abnormalities compared to USG. Dandy Waker variant was diagnosed in these are two different case where MRI confirmed the diagnosis [Table/Fig-9]. Ventriculomegaly was diagnosed by USG in one case, which were further confirmed my postnatal USG/MRI.

Holoprosencephaly was seen in two cases by both USG and MRI (one alobar and one lobar) which were confirmed by postnatal MRI. Neural tube defect was seen in two cases and was diagnosed both by USG and MRI [Table/Fig-10]. On MRI and USG, partial agenesis was seen as reveals colpocephaly, parallel ventricles, interdigitated falx. MRI reveals classic Viking horn appearance. Corpus callosum is seen in anterior region, genu and body. Splenium and posterior

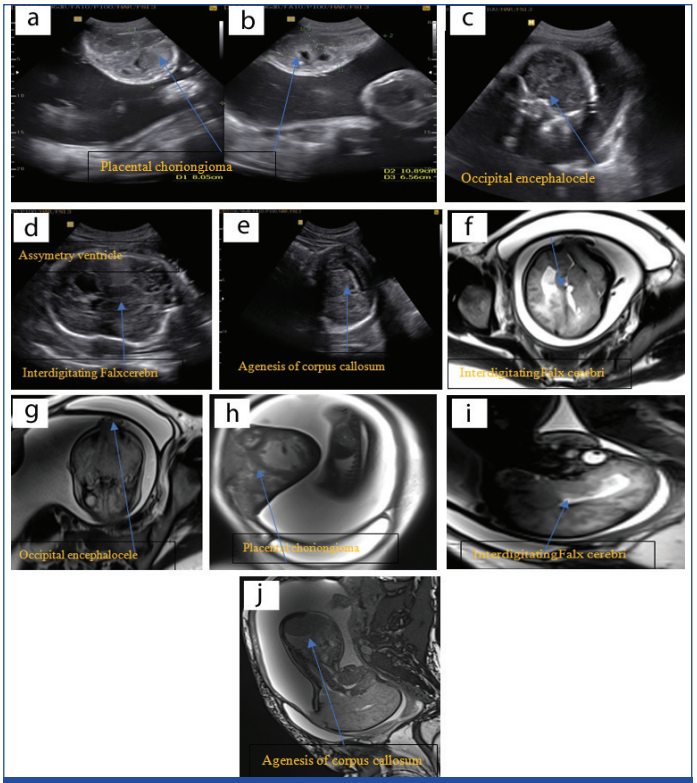
System (Total anomalies)	Major	Minor
CNS anomalies (N=21)	Corpus callosum agenesis -2	Isolated ventriculomegaly-1
	Holoprosencephaly-2	
	Chiari malformation-1	
	Anencephaly-2	Mega cisterna magna-1
	Encephalocele-2	
	Hydrocephalus-3	
	Vein of Galen malformation-1	
	Hydranencephaly-1	Choroid plexus cyst-1
	Dandy walker malformation and variants-2	
	Neural tube defect- 2	
CVS anomalies (N=12)	ASD-2	Single umbilical artery-1
	VSD-2	
	HLHS-1	
	Complex CHD -1	Echogenic spot in left ventricle-1
	Single ventricle-1	
	Noonan syndrome-1	
	Pentalogy of cantrell-1	
	Giant right atrium-1	
GIT anomalies (n=10)	Gastroschisis-2	Distended stomach -1
	Ileal atresia-1	
	Hirschsprung's disease-2	
	Omphalocele-2	
	Duodenojejunal atresia-1	
	Hypertrophic pyloric stenosis-1	
GU anomalies (n=10)	VUR-1	Pyelectasis -2
	PUJ obstruction-2	
	MCDK-1	
	ADPKD-1	
	Post urethral valve-1	
	Renal agenesis-1	
	Congenital adrenal hyperplasia-1	
MSK anomalies (n=5)	Thanatophoric dysplasia-1	Isolated short femur-1
	CTEV-1	
	Complex skeletal dysplasia-1	
	Achondroplasia-1	
Head and neck anomalies (n=2)	Cystic hygroma-1	
	Cleft lip-1	
Chest anomalies (n=5)	CCAM-1	Hypoplastic thorax-1
	Congenital lobar emphysema-1	
	Diaphragmatic hernia -2	

[Table/Fig-4]: Overall distribution of congenital defects. (No. of patients).
ASD: Atrial septal defect; VSD: Ventricular septal defects; HLHS: Hypoplastic left heart syndrome; CHD: Coronary heart disease; VUR: Vesicoureteral reflux; PUJ: Pelviureteric junction; MCDK: Multicystic dysplastic kidney; ADPKD: Autosomal dominant polycystic kidney disease; CTEV: Congenital talipes equinovarus; CCAM: Congenital cystic adenomatoid malformation; CNS: Central nervous system; CVS: Cardiovascular system; GIT: Gastrointestinal; GU: Genitourinary; MSK: Musculoskeletal abnormalities

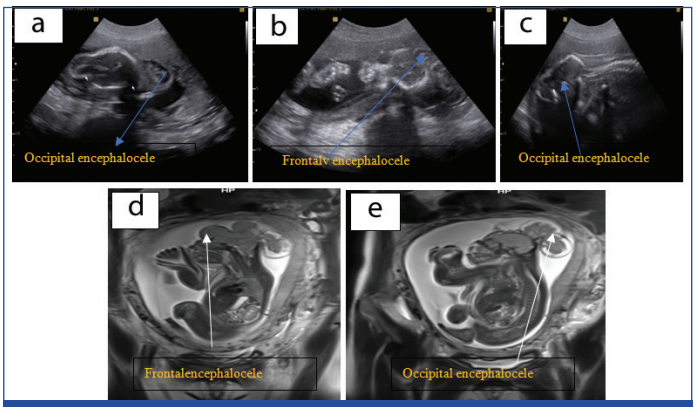
body of corpus callosum is not visualised [Table/Fig-11]. Mega cisterna magna was seen in one case by both USG and MRI. Postnatal USG confirmed the diagnosis.

Evaluation of Cardiovascular Anomalies

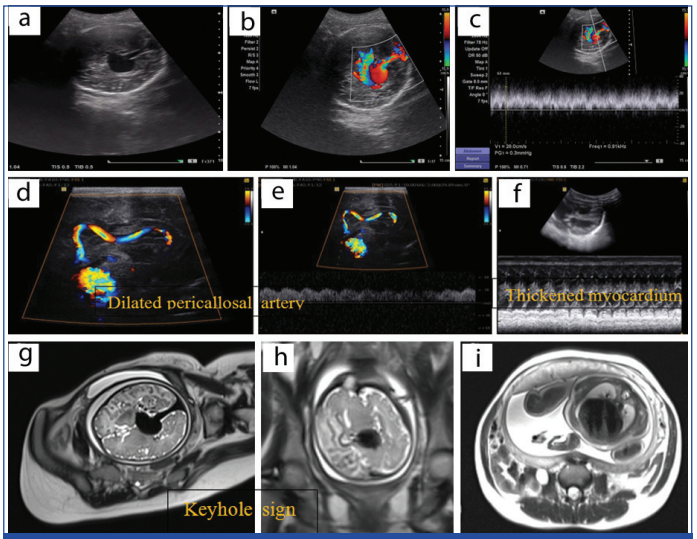
Cardiovascular anomalies, the second commonest group were seen in 12 cases. Septal defects were visualised by both MRI and USG, but USG was superior. Moreover, functional assessment was possible only by USG. One case of giant right atrium was diagnosed by USG, but the internal structures of the developing heart was not properly visualised by MRI.



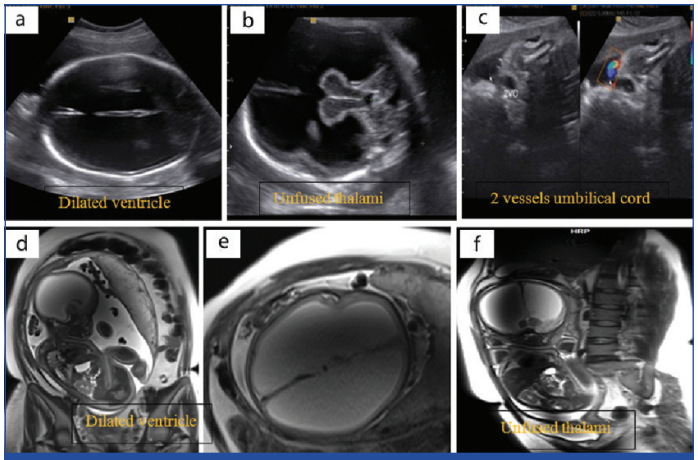
[Table/Fig-5 (a-j)]: Agenesis of Corpus Callosum- Complete Variety, Occipital Encephalocele, Placental Chorioangioma. Asymmetric Ventriculomegaly, Absence of Corpus Callosum, Interdigitated Falx Cerebri on USG. Saggital T2 Haste and Trufi MRI Reveals Occipital Encephalocele with Agenesis of Corpus Callosum. A Mass was also seen in both USG and MRI Diagnosed as Chorioangioma.



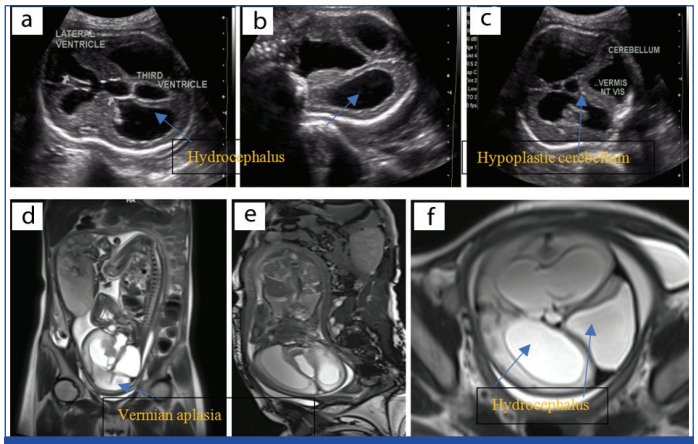
[Table/Fig-6 (a-e)]: Occipital and frontal encephalocele.
Axial, coronal and saggital USG shows large part of the brain protruding through the calvarial defect. MRI vividly depicts the frontal and occipital encephalocele



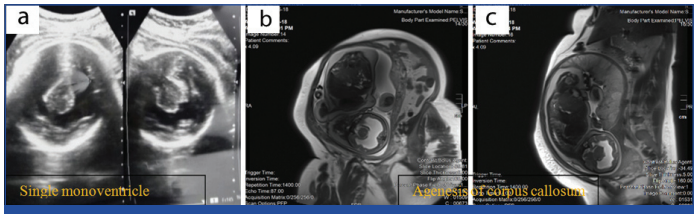
[Table/Fig-7 (a-i)]: Vein of Galen aneurym with high output cardiac failure.
Axial USG shows anechoic key hole lesion with High Flow. Axial T2 Haste MRI brain reveals signal void lesion, dilated pericallosal artery and of thorax reveals cardiomegaly. postnatal usg shows dilated pericallosal artery, thickened myocardium (M Mode)



[Table/Fig-8 (a-f)]: Hydranencephaly.
Grossly dilated lateral ventricles, unfused thalami, midline falx and cerebellum is present, two vessel umbilical cord. mri reveals normal cerebral aqeuduct and fourth ventricle, midline falx and unfused thalami



[Table/Fig-9 (a-f)]: Dandy walker malformation.
USG reveals posterior fossa cystic mass, Gross hydrocephalus and hypoplastic cerebellum, MRI shows cystic dilatation of fourth ventricle, Tentorial elevation, Vermian aplasia, Severe obstructive hydrocephalus



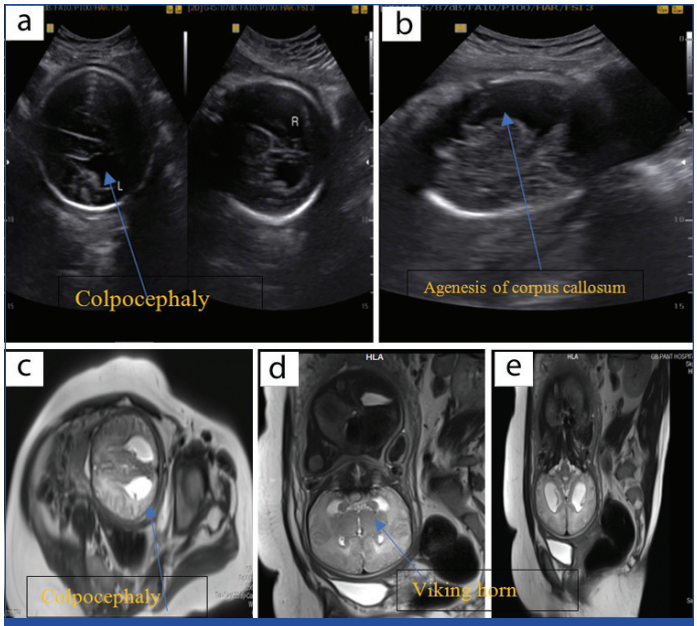
[Table/Fig-10 (a-c)]: Holoprosencephaly USG and MRI Shows single midline monoventricle, Absent septum pellucidum, agenesis or hypoplasia of corpus callosum, absent interhemisperic fissure and falx cerebri, absent olfactory tract.

Evaluation of Genitourinary Anomalies

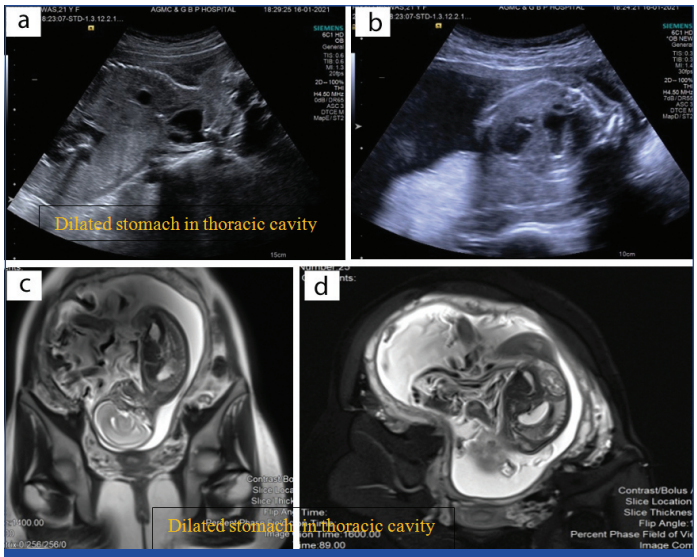
Among 10 cases of genitourinary abnormalities, one case was diagnosed to have posterior urethral valve by USG and MRI revealed bilateral hydronephrosis and duodenal atresia. Autosomal Dominant Polycystic Kidney Disease (ADPKD) was seen in one case by USG. MRI revealed the enlarged echogenic kidneys well but few small cysts measuring 3 mm were not visualised by MRI. Multicystic Dysplastic Kidney (MCDK) was diagnosed in one case and the small were well visualised by both the modalities. Foetus hydronephrosis was seen in 2 cases due to Pelvic Ureteric Junction (PUJ) obstruction. Dilated Pelvic Congestion Syndrome (PCS) was visualised by both USG and MRI. Vesicoureteral Reflux (VUR) was seen in one case. Foetus pyelectasis was seen in two cases. On postnatal imaging dilated PCS resolved after three months.

Evaluation of Chest Anomalies

Thoracic abnormalities were seen in five cases. Two cases of diaphragmatic hernia were diagnosed by USG. Stomach position, cardiac compression was seen well by both USG and MRI. Congenital Cystic Adenomatoid Malformation (CCAM) was seen in one case by USG. The small cysts were seen well in both USG and MRI. Congenital lobar emphysema was seen in one case and was seen by both USG and MRI. One case of hypoplastic thorax was seen with decreased thoracic diameter [Table/Fig-12].



[Table/Fig-11 (a-e)]: Partial agenesis of corpus callosum.
MRI reveals colpocephaly, parallal ventricles, interdigitated falx. MRI reveals classic viking horn appearance. Corpus callosum is seen in anterior region, genu and body. Splenium and posterior body of corpus callosum is not visualised



[Table/Fig-12 (a-d)]: Congenital diaphragmatic hernia: USG and MRI shows dilated stomach in the left side of thorax.

Evaluation of GIT and Musculoskeletal Abnormalities

Gastrointestinal abnormalities were seen in 10 cases. No additional findings were detected by MRI. Musculoskeletal abnormalities were seen in five cases. Details of long bones, hands and feet were exquisitely visualised by MRI. Spine was seen well by MRI compared to USG. But no additional information was detected by MRI.

Out of 65 cases, total 52 foetal anomalies were correctly diagnosed on MRI so, sensitivity of MRI was 88.13%, it means 88.13% of the foetus anomalies were correctly diagnosed on MRI and remaining 12% showed a false negative result, while sensitivity of USG was 82.43% it means 82.43% of the foetus anomalies were correctly diagnosed on USG and remaining 18% showed a false negative result.

Specifity of MRI was 66.6% means that those 66.6% who don't have foetus anomaly showed true negative results, however, specifity of USG was 77.7 % means that those 77.77% who don't have foetus anomaly showed true negative result. USG and MRI yielded comparably high sensitivity for detecting anomalies [Table/Fig-13].

In this study, total 14 out of 65 cases were additionally diagnosed by mri and changed the diagnosis of USG (21.53%) [Table/Fig-14].

Parameters	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Diagnostic accuracy (%)
MRI (Overall)	88.13	66.66	96.29	36.36	90.77
USG (Overall)	82.43	77.77	95.83	41.17	86.15
MRI (CNS anomalies)	89.19	57.14	91.66	50	85.71
USG (Non-CNS anomalies)	75	85	97.14	96.77	90.90
USG (CNS anomalies)	85	75	97.14	96.77	81
MRI (Non-CNS anomalies)	75	85	97.14	96.77	84.09

[Table/Fig-13]: Sensitivity, Specificity, PPV, NPV and diagnostic accuracy of USG and MRI compared with postnatal diagnosis as the gold standard.

	USG diagnosis	Additional finding with MRI
CNS-	Complete Agenesis of Corpus Callosum + Ventriculomegaly + Occipital Encephalocele + Polyhydramnios	Complete Agenesis of Corpus Callosum + Ventriculomegaly + Occipital Encephalocele + Abnormal Cortical Sulcation + Interdigitated Falx + Viking Horns + Polyhydramnios + Chorioangioma of Placenta
	Ventriculomegaly	Lobar Holoprosencephaly, Falx Present
	Lateral Ventriculomegaly	CHIARI 2 Malformation
	Meningomyelocele	Meningomyelocele with Tethered Cord
	Hydrocephalus	Aqueductal Stenosis
	Dilated Lateral and Third Ventricles + Large Cystic Lesion in Posterior Fossa Communicating with the Fourth Ventricle	Dandy Walker Malformation + Ventricular Dilatation, Elevated Tentorium, Vermian Hypoplasia
	Isolated Ventriculomegaly	Normal
	Ventriculomegaly	Obstruction Hydrocephalus with Aqueductal Stenosis
GUA	Posterior Urethral Valve	Posterior Urethral Valve, BIL Hydronephrosis, Duodenal Atrsia.
CVS	Giant Right atrium	Failed
MSK	Thanophoric dysplasia	Details of long bone
GIT	Diaphragmatic Hernia	NTD, VSD, Clinodactyly, Diaphragmatic Hernia, Cleft Lip
	Gastroschisis, Ectopia Cordis and Diaphragmaic Abnormality Pentalogy of Cantrell	Gastroschisis, Ectopia Cordis and Diaphragmatic Abnormality Pentalogy of Cantrell
	Post Thoracic Wall Mass	Thoracic Meningomyelocele
	Conjoined Twin	Craniothoracoomphalopegas

[Table/Fig-14]: Additional findings and missed diagnoses of anomalies following MRI.

DISCUSSION

Ultrasonography is the primary imaging modality for foetus evaluation, and its availability and low cost make it the ideal screening method for low-risk populations. Foetus MRI is also a safe and robust technique in cases of equivocal sonographic findings [11].

According to Hussamy DJ in a population-based cohort study, calculated risk was at least 1:270 in 93% of Down syndrome pregnancies and more pregnancies had multiple risk factors than had a single risk factor [12]. In our study, also around 45% were present with the history of risk factor.

In this study CNS anomalies were better detected by MRI compared to USG. This study coincided with Yong Seak S et al., that foetus MRI has an advantage over ultrasound in evaluation and detection of posterior fossa abnormalities, causes of ventriculomegaly, intracranial abnormalities and brain atrophy, this was also confirmed by Blaicher W et al., [13,14].

In this study, foetus MRI was helpful in evaluating abnormalities of the posterior fossa which includes dandy walker and giant cisterna magna which are difficult to be diagnosed by ultrasound alone and this was in agreement with other studies [6]. In this study, the foetuses with callosal anomalies were diagnosed on ultrasound but with MR imaging, callosal anomalies were seen clearly along with the many associated subtle features. Partial agenesis was better visualised with MRI. These findings coincide with Kier E and Truwit C [15].

Kwong Y et al., found that the visualised anatomy obtained by MRI was far superior than on sonography and allowed categorisation of vein of galen malformation sub-type. Genetic analysis on the mother and both foetuses showed variant RASA1 gene mutation [16].

In this study, vein of galen malformation was seen as anechoic key hole lesion with high flow and on MRI, reveals signal void lesion, dilated pericallosal artery and of thorax reveals cardiomegaly. Wagner MW concludes that secondary complications of the VGAM, hemodynamic alterations such as cardiac failure, foetus hydrops, and brain injury. Heart failure results from increased cardiac preload secondary to arteriovenous shunts leads to cardiomegaly and hydrops foetusis. Injury to the cerebral gray and white matter is called “melting brain” [17].

Foetus cardiac abnormalities are not well visualised by MRI. This is due to high foetus heart causing motion artifacts. Moreover, the heart can be assessed in realtime by USG compared to MRI and all the necessary measurement can be performed to evaluate the function of the heart. In this study two cardiac anomalies out of three were missed by MRI and were visualised by USG.

Hamisa M et al., in 2013 conducted a study on 23 pregnant women. In their study, they found that MRI and ultrasound showed similar findings in six cases. MRI changed the diagnosis in 14 cases and provided additional information in two cases. Ultrasound was superior to MRI in one case at the second trimester due to foetus motion. This study results were contradictory to the study conducted by Hamisa M et al., since in our study MRI was superior than USG [18].

Zialhaq P et al., provided additional information on MRI than US in 2/23 cases (8.69%), 23.8% performed by Whitby E et al., which can be explained by more number of patients having spinal involvement in their study [19,20]. MRI changed the diagnosis in 11/23 cases (47.8%) and in this study we found 14/65 case (21.53%). Hosny IA and Elghawabi HS, reported 16% cases additional information which is nearer to this study and according to Bhosle PR provided more information on MRI than did US in 5/31 cases (16.1%) [21,22].

Limitation(s)

Small sample size. Foetus cardiac abnormalities are not well visualised by MRI due to high foetus heart rate causing motion artifacts. Foetus MRI has inherent limitations of high cost, less widely available and motion artefacts and also reverberation artifacts and poor penetration through the ossified foetus skull result in a reduced visualisation of the brain.

CONCLUSION(S)

Both ultrasound and foetus MRI are highly sensitive and specific in diagnosis of congenital anomalies of the foetus. Real time dynamic nature of ultrasound, capabilities and doppler provides a useful upper hand in evaluation of structural and vascular anomalies. Foetus MRI provides high confidence in ultrasound aided diagnosis. It has better sensitivity in detection of CNS abnormalities and subtle small lesions with high confidence. Foetus MRI had a higher sensitivity for diagnosing CNS anomalies than USG. The additional information provided by foetus MRI would have led to a change in counseling and/or management.

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