

Sonography Advantages and Role of Radiologist in Detection of Second Trimester Anomaly in Peripheral District and Remote Areas

Ami Dave¹, Janardan Joshi², Tejas Kothawade³

¹Class 1 Radiologist, Department of Radiology, ²Senior Consultant Radiologist, Department of Radiology, ³Junior Resident Doctor, Department of Radiology, Bhavsinhji And M.r. Hospital, Porbandar, Gujarat, India

Corresponding author: Dr. Ami Dave, 403, Platinum Tower, Opp. Satyanarayan temple, MG Road, Porbandar 360575, India

How to cite this article: Ami Dave, Janardan Joshi, Tejas Kothawade. Sonography advantages and role of radiologist in detection of second trimester anomaly in peripheral district and remote areas. International Journal of Contemporary Medicine Surgery and Radiology. 2022;7(2):B2-B4.

ABSTRACT

Introduction: Anomaly scan at the second trimester provides the detail anatomical examination of fetus. The main objective of this study was to detect structural and morphological fetal anomalies in antenatal scan and also highlight the advantages of ultrasound examinations in peripheral district and remote areas.

Material and Methods: The observational study was conducted in 5000 patients from June 2021 to June 2022 in the department of Radiology Bhavsinhji civil hospital, Porbandar, Gujarat after taking proper consent from them.

Results: In our study, Anomalies detected during second trimester anomaly scan were Anencephaly, encephalocele, meningocele, meningomyelocele, omphalocele, echogenic bowel, hydropsfetalis, multicystic kidney, polycystic kidney, spina bifida, skeletal dysplasia, club foot.

Conclusion: Our study revealed that antenatal ultrasonography performed in second trimester is highly effective in diagnosing fetal anomalies. It also proves the importance of availability of ultrasonography machine in remote and peripheral areas in the presence of expert and skilled Radiologist.

Key words: Ultrasound, Anomaly Scan, Congenital Anomalies, Second Trimester, Malformations

INTRODUCTION

Among the indicated ultrasonographic examinations in pregnancy, the second trimester targeted anomaly scan considered to be the most important scan. Congenital anomalies are one of the leading causes of perinatal and neonatal morbidity and mortality. Globally, congenital malformations affect approximately 2-3% of all live births every year.

The main objective of second trimester ultrasound examination is to accurately date pregnancy, evaluate fetal anatomy and assess placental location and the adnexae. Detection of structural fetal anomalies is dependent on numerous factors such as maternal age, gestational age, maternal drug history, previous fetus or child with a congenital abnormality, obstetric care, skills and experience of radiologist as well as quality of equipment used.

MATERIAL AND METHODS

This was a hospital based observational study done during the period of June 2021 to June 2022 in the department of radiology, Bhavsinhji civil hospital, Porbandar, Gujarat. Patients referred from obstetric department for second trimester anomaly scan and those who had given consent to participate in study were enrolled in the study. The F- form which required all the necessary data of the patient were

filled up by the radiologist as per PC and PNDT guidelines. Ethical clearance was obtained from the hospital ethical committee administration.

The following parameters were taken into consideration while performing ultrasonographic examination:

Biometry - The following measurements are routinely obtained to calculate Estimated Fetal Weight (EFW) and Estimated Date of Delivery (EDD)-

- Biparietal diameter (BPD)
- Femur length (FL)
- Head circumference (HC)
- Abdominal circumference (AC)

Morphological assessment

Fetal head - Ventricles and choroid plexus, midline falx, cavum septum pellucidum, cerebellum, cistern magna.

Fetal face - Nasal bone, orbits, upper lip and palate, mandible.

Fetal heart and chest - Heart rate, four chamber view, Left ventricular outflow tract, Right ventricular outflow tract.

Fetal abdomen - Liver, Stomach (situs, presence, size), urinary bladder, umbilical cord insertion and umbilical vessel number.

Fetal musculoskeletal - Spine, Upper limb (humerus, radius, ulna, hand), Lower limb (femur, tibia, fibula, foot).

Placenta, amniotic fluid, adnexae

Transabdominal ultrasound examination using Philips iU22 machine was performed by expert radiologists and data as well as images saved in the machine. The average time allocated was 25 to 40 minutes per scan. All examinations performed in supine position of patient. Descriptive analysis done by using software.

RESULTS

As per hospital registry records there were approximately 5000 women who came for antenatal checkup during the period in our centre. Patients underwent second trimester anomaly scan with reference from obstetric department and registered with their information in the department of radiology.

Following conditions were detected during anomaly scan in this study

Fetal conditions	Placental conditions	Maternal conditions
Anencephaly	Vasa previa	Leiomyoma
Encephalocele	Placenta previa	Bicornuate Uterus
Meningocele	Subchorionic hemorrhage	Severe oligohydromniosis
Meningomyelocele	Placentomegaly	Short cervix
Ventriculomegaly		Ovarian cyst
Omphalocele		
Echogenic bowel		
Hydropsfetalis		
Multicystic kidney		
Polycystic kidney		
Hydronephrotic kidney		
Pelvic kidney		
Spina bifida		
Skeletal dysplasia		
Club foot		
IUGR		

DISCUSSION

The Congenital anomalies detected prenatally by ultrasound in second trimester can broadly classified as Central Nervous System (anencephaly, encephalocele, meningocele, ventriculomegaly), Abdomen (omphalocele, echogenic bowel, dilated bowel loops), Urogenital (multicystic kidney, polycystic kidney, ovarian cyst), Musculoskeletal (skeletal dysplasia, club foot, intrauterine growth restrictions) anomalies. The detection rate of screening second trimester ultrasonography was good in high risk patients examined by the well trained radiologist. In low risk pregnant women the scan could also be sensitive in anomaly detection if a systemic searching pattern was followed. A normal scan is often obtained but there is tremendous relief of psychological distress, anxiety and somatic symptoms after the report.

There were some limitations to this study since this was a preliminary study done in our hospital which may not reflect the results representing the entire general population. Risk factors like consanguineous marriage, previous malformed baby were not recorded. Chromosomal anomalies could not be included due to lack of resources available.

CONCLUSIONS

Most common anomalies detected in our study are Neural Tube Defects followed by Abdominal defects. The diagnosis of fetal anomaly significantly reduces perinatal mortality and morbidity and maternal morbidity. Diagnostic ultrasonography is a radiological technique which is cost effective and readily available in peripheral district and remote areas. Antenatal ultrasonography is widely used to assess fetal growth and anatomy and is now an integral part of routine antenatal care. It allows to detect anomalies even at rural and remote areas with availability of expert and skilled radiologist so that further complications of pregnancy can be managed very well in advanced time.

It also prevents an unnecessary cesarean section for a fetus with lethal anomalies diagnosed too late for medical termination of pregnancy and allow planning delivery at the optimal time in a well equipped tertiary centre with necessary neonatal care facilities. Since clinical signs and symptoms are not reliable in diagnosing fetal anomalies, ultrasonography can play a pivot role in its diagnosis.

REFERENCES

1. Premnath KPB, Joy B, Toms A, Sleeba T. Image Acquisition Adequacy for Second Trimester Targeted Fetal Scans - A Clinical Audit. *Int J Sci Stud* 2017; 5(3):57-60.
2. Dastgiri S, Stone DH, Le-Ha C, Gilmour WH. Prevalence and secular trend of congenital anomalies in Glasgow, UK. *Arch Dis Child.* 2002; 86:257-63
3. Akinmoladun JA, Ogbale GI, Lawal TA, Adesina OA. Routine prenatal ultrasound anomaly screening program in a Nigerian university hospital: Redefining obstetrics practice in a developing African country. *Niger Med J.* 2015;56(4):263-67.
4. WHO South East Asia Regional Neonatal-

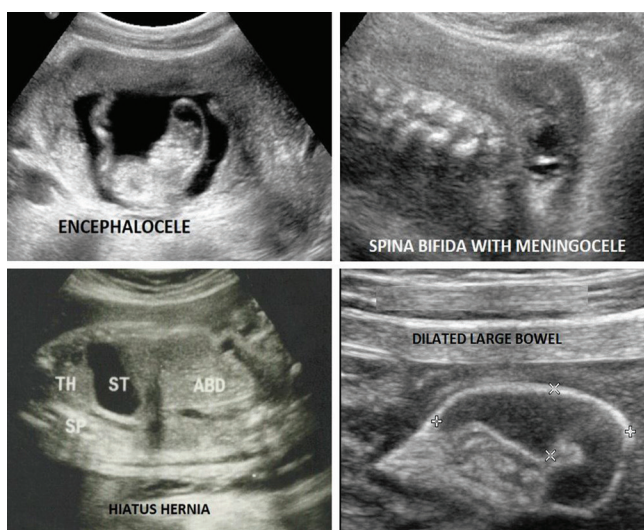


Figure-1:

- Perinatal Database Report 2007-2008. Available from <http://ghdx.healthdata.org/record/who-south-east-asiaregional-neonatal-perinatal-database-report-2007-2008>. Accessed July 7 2019.
5. Ewigman BG, Crane JP, Frigoletto FD, LeFevre ML, Bain RP, McNellis D. Effect of prenatal ultrasound screening on perinatal outcome. RADIUS Study Group. *N Engl J Med.* 1993;329:821–27.
 6. Kashyap N, Pradhan M, Singh N, Yadav S. Early Detection of Fetal Malformation, a Long Distance Yet to Cover! Present Status and Potential of First Trimester Ultrasonography in Detection of Fetal Congenital Malformation in a Developing Country: Experience at a Tertiary Care Centre in India. *J Pregnancy.* 2015; 2015:623059
 7. Birth Defects In South-east Asia A Public Health Challenge Situation Analysis WHO 2013;2(1):75 19. Sugunbai NS, Mary M, Shymalan K, Nair PM. An etiological study of congenital malformations in newborns. *Indian Pediatr.* 1982; 19:1003–09.
 8. Carol Rumack's diagnostic ultrasound 5th edition 2018.
 9. Callen's Ultrasonography in Obstetrics and Gynecology 6th edition 2017.
 10. WHO manual of diagnostic ultrasound 2nd edition 2011.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 10-03-2022; **Accepted:** 01-06-2022; **Published online:** 30-06-2022