

Fellowship in advanced obstetric ultrasound: One-year programme

Eligibility Criteria for admission:

Postgraduate Diploma or Master's Degree in Obstetrics and Gynaecology or Radiology; Minimum of 2 years of post PG practice which includes gaining knowledge/experience in basic obstetrics/Obstetrics USG; preferably not more than 7 yrs after passing out of postgraduation.

Program Objective, scope, motivation:

Practicing obstetrics without a knowledge of obstetric ultrasound is near to impossible in the current clinical scenario.

The current postgraduate curriculum does not involve specific training modules or hands on experience on ultrasound training. This course aims to provide adequate training to young Obstetricians and Radiologists to perform Obstetric ultrasound to International standards. This is achieved by a continuous learning process with theory and practical knowledge combined with hands on experience so that they would be able to perform obstetric scans across all gestations with confidence. During this period, they would be given adequate training to obtain the certificates of competencies from the fetal Medicine Foundation UK.

This short-term course is aimed at practising Obstetricians and Radiologists who don't aspire to specialise in fetal medicine but would like to improve their skills in Obstetric Ultrasound scanning to complement their clinical practice.

Program Structure/highlights:

1. Duration of the program - One-year programme; The training is at DFM (Division of Fetal Medicine), Department of Obstetrics and Gynecology, KMC Manipal.

2. Syllabus/curriculum

During the first six months of their training at KMC, Manipal, the candidates would undergo training at KMC Manipal which would comprise of the following:

First Module

1. Orientation and Knology
2. Acquire basic scanning planes across all gestations
3. Perform NT scans, anomaly scans and growth scans under supervision and register with the Fetal Medicine Foundation for submission of images.
4. Participate in lectures provided by the faculty in obstetric ultrasound
5. Discuss and decide to choose a topic for an audit project
6. Observe counselling in simple and complex clinical scenarios
7. Attend Genetic counselling clinics
8. RITA - Rigorous In Training Assessment

Second Module

During the next six months, they will move onto next part of training which includes:

1. Further training in advanced aspects of obstetric scans.
2. Develop to learn 3D/4D ultrasound imaging and its application in clinical practice
3. Participate in joint multidisciplinary clinical meeting to present and discuss complex case scenarios
4. Obtain certifications of competency from the Fetal Medicine Foundation.
5. Participate in Genetic counselling, Perinatal mortality meetings in joint association with other centres
6. Present results from Audit at regional and national conferences

7. RITA followed by Exit exam at the end of training; with an external examiner (Theory and practical components)
8. Issue of certificate for successful candidates following completion of the training modules and achieving a pass mark in the exit examination.

Necessary training is planned in such a way that they receive the training on par with international standards. There would be continuous exchange of clinical learning material combined with classroom and online lectures which would help in continuous learning of the candidate on a wide range of clinical conditions. We aim to closely involve our adjunct faculty (Expert foetal medicine specialists in India) in teaching program so that our trainees get the maximum benefit from their experience in the field.

3. Attendance : 95% mandatory
4. Examination pattern : Exit exam at the end of training; with an external examiner (Theory and practical components).
5. Minimum for pass -

MAHE BoS Meeting held on 19/02/2021 has modified this - Criteria for passing - kept at 50% , Minimum 50% independently in theory and practical's, if the candidate gets >75% - pass with distinction

6. Number of attempts - 2
7. Reference list of books & journals

Textbooks

1. Callens Textbook of USG in Obstetrics and Gynecology
2. Fetology, a textbook on Fetal Abnormalities
3. Creisy and Resnik's Textbook on Maternal Fetal Medicine

Journals:

- Ultrasound in Obstetrics and Gynecology
- Prenatal Diagnosis
- Journal of Ultrasound in Medicine
- Fetal Diagnosis and therapy

Websites: for reference and education

www.isuog.com
www.perinatology.com
fetalmedicine.org

8. Collaborations with other departments Institutions/ Genetics, radiology, paediatrics, neonatology.
9. Industry placements/Internships - NA

10. Prospects & Placements - This certificate course will give them an edge over other young obstetricians/radiologists to perform obstetric ultrasounds with confidence, will give them competency certifications for NT/targeted mid-trimester anomaly scans-in par with international standards, will help them to practice high risk maternal-fetal medicine. Overall, this will help them get better opportunity for getting jobs in high-risk obstetric practice.

Detailed Syllabus/Curriculum:

Image optimization, Knobology and basic principles of USG/Dopplers:

Safe optimisation of the image for 2D and Doppler ultrasound.
The risks associated with the different ultrasound modalities and how to limit them – mechanical index (MI) and thermal index (TI).

How to use machine controls to optimise the image, including, power, gain, focal length, magnification, sector width, frame rate, pulse repetition frequency, colour and power Doppler modes.

Basic principles of the use and interpretation of 3D/4D ultrasound

Doppler ultrasound: the pathophysiology, the physics, when to use it and its interpretation

How Doppler assessments are used to monitor growth restriction, time birth and detect fetal anaemia

How fetal anomalies may influence the Doppler waveforms (for example cardiac arrhythmias, fetal anaemia, hydrops, and twin-twin transfusion syndrome)

Evaluation of fetal growth and diagnosis of growth abnormalities

Defines, recognises, monitors and manages severe early onset and late onset fetal growth restriction

Macrosomia

Performs and records a detailed, systematic structural survey of the fetus as per standard recommendation (ISUOG/FMF).

Understands the strengths and limitations of ultrasound for each system within each trimester.

Explains normal anatomy views to the woman.

Documents and records normal anatomy views.

Recognises when image quality is technically poor.

Is able to explain next steps if normal views cannot be obtained

The normal appearances on ultrasound scan in all trimesters (including 11-14 weeks and third trimester survey) of the fetal CNS, face and neck, thorax, cardiovascular system, abdominal wall and gastrointestinal tract, urogenital system and the fetal skeleton and extremities

Normal embryology of all body systems, and how errors in these processes result in the more common fetal abnormalities detected by sonological survey.

Normal fetal behaviour and activity, and abnormalities of this Fetal circulation, and how it adapts at birth

Understands, demonstrates, and explains the key pathological conditions targeted by the fetal USG

USG Diagnostic features of each condition, their differential diagnosis and chance of structural, chromosomal and syndromic associations.

Ex for such conditions: Trisomy 21, 18 and 13, anencephaly, spina bifida, congenital diaphragmatic hernia, gastroschisis, exomphalos, renal agenesis, facial cleft, hypoplastic right or left heart, lethal skeletal dysplasia, etc.

The implications for the current pregnancy and the long-term prognosis for each condition, and recurrence risks for future pregnancies

The limitations of ultrasound in detecting and diagnosing congenital abnormalities (e.g. cleft palate) or predicting prognosis (e.g. diaphragmatic hernia)

Working knowledge on - antenatal management, intrapartum care and immediate postnatal management of each condition.

Triggers and diagnoses necessitating tertiary referral

The impact of the diagnosis and individual circumstances on the timing, location and mode of birth

The local prenatal, birth and post-birth pathways for care of the fetus and newborn with these conditions

The legal framework under which termination of pregnancy may be offered

Recognise which conditions are amenable to prenatal treatment (e.g. diaphragmatic hernia, spina bifida in the world scenario and TTTS/TRAP in Indian set up)

Examples for some other important fetal anomalies:

CNS:

The thresholds for diagnosing mild, moderate and severe ventriculomegaly measurements, and the potential implications of the different severities of ventriculomegaly
The role of MRI for CNS lesions.

The difference between Dandy Walker malformation, DW Variant and Mega cisterna magna, the implications of each and the pitfalls in prenatal diagnosis

Encephalocele, holoprosencephaly, microcephaly, macrocephaly, intracranial mass, corpus callosal abnormalities, cerebral calcifications, craniosynostosis, hydrancephaly, porencephaly, intracranial haemorrhage, Vein of Galen Malformation

Face:

Facial clefts, hypo/hypertelorism, abnormalities of nasal bone, macroglossia, micrognathia/retrognathia, microphthalmia/anophthalmia

Thorax and neck:

Laryngeal/tracheal atresia, CHAOS, pulmonary sequestration, CPAM, CDH, mediastinal mass, pulmonary agenesis, neck tumors, esophageal atresia, and TEF, pleural effusion

CVS:

The different types of VSD, ASD, AVSD, and their association with cardiac, extracardiac and chromosomal anomalies.
cardiac tumours

The common fetal tachy- and brady – arrhythmias

The ultrasound features of transposition of the great arteries, atresia of either outflow tract, stenosis of either outflow tract, double outlet right ventricle or a common outflow tract (truncus arteriosus), Ebstein's anomaly, Hypoplastic Rt and Lt heart, Pulmonary and aortic stenosis, Tetralogy of Fallot and DORV, TGA, heterotaxy, cardiomyopathy and tumors.

The association of these conditions with further cardiac, extracardiac and chromosomal anomalies

The role of the paediatric cardiologist in the management of fetal cardiac problems

GIT:

Meconium ileus, hepatic calcification/mass, abdominal cyst, ascites, GIT atresia/stenosis, intraabdominal SOLs and calcifications, Hirschsprung's disease

All types of abdominal and thoracic wall defects and body stalk anomalies, amniotic band sequence

The ultrasound features of GI atresia, associations and surgical options following birth

The spectrum of ultrasound findings of echogenic bowel and its association with chromosomal anomalies, cystic fibrosis, growth restriction and viral infections

Genito-urinary:

Aetiology, spectrum of severity postnatal investigation and the likely short- and long-term impact of these conditions
renal cystic disease, duplex kidney, bladder/cloacal exstrophy, echogenic kidney, urinary tract dilatation and obstruction, MCDK, PCDK, renal agenesis
Ambiguous genitalia, persistent cloaca, sirenomelia

Skeletal:

Diagnosis and the local pathway for postnatal referral for talipes

Limb reduction defects: associations and aetiology
common skeletal dysplasias, sirenomelia, sacral agenesis, hemivertebra, vertebral segmentation defects, etc
Findings suggestive of lethal skeletal dysplasia and the features of the more common non-lethal dysplasias, particularly certain types of osteogenesis imperfecta and achondroplasia

fetal akinesia/hypokinesia sequence

sacroccygeal teratoma

-Amniotic bands, abnormalities of extremities, radial ray defects

In addition,

-Detailed anatomical survey in 11-14 weeks and knowledge on anomalies which must be and which can be diagnosed at 11-14 weeks

Increased NT, cystic hygroma, extended aneuploidy markers, hydrops, cystic hygroma etc

The additional information which might be gained by use of 3D imaging and/or fetal MRI

Prenatal aneuploidy screening/genetic screening:

The genetic basis for trisomy 21, 18 and 13 and the ultrasound features associated with them

The range of tests available for screening and testing for the common trisomies and the organisation and quality control of the screening service

When it is appropriate to offer invasive testing, and when not to

The role of non-invasive testing

USG clues for Diagnosis of submicroscopic structural chromosomal abnormalities like microdeletions and duplications – only diagnosed with CMA

Single gene disorders- WES etc

Tetrasomy 12p (Pallister-Killan Syndrome)

22q11.2deletion (DiGeorge syndrome)

Meckel's syndrome

Prediction of preeclampsia and uterine artery Dopplers

Abnormalities of umbilical cord and placenta

Infections in pregnancy which may have an impact on the fetus:

Able to diagnose USG features suggestive of intrauterine infection and suggests further plan of investigations and management, counsels on possible prognostic factors

USG in Multiple Pregnancy

Diagnosis of chorionicity and its importance

Defines, recognises, monitors and manages a twin pregnancy with growth discordance and twin to twin transfusion syndrome

The embryology of normal twinning and the incidence and pathogenesis of abnormal twinning, resulting in TTTS, TRAP sequence, and conjoined twins

When treatment is indicated for these conditions, and the pros and cons of treatment options

A differential diagnosis for selective fetal growth restriction and the classification of selective fetal growth restriction in monochorionic gestations, and the impact that chorionicity has on outcomes and interpretation of surveillance

The differential risks associated with co-twin death in monochorionic and dichorionic multifetal gestations

The outcomes of higher order pregnancies, and the impact on these of multifetal pregnancy reduction

Definition of significant growth discordance in twin gestations and the importance of chorionicity

The clinical and ultrasound features of TTTS, and referral triggers for fetal medicine subspecialty input

The management of TTTS and follow up regimes following treatment

Be aware of the ultrasound features of TRAP (Twin reverse arterial perfusion sequence) and conjoined twins, discordant malformation in twins, IUD of one twin, monoamniotic twins.

Red Cell alloimmunization:

Provides appropriate antenatal care for the pregnant woman with red cell alloimmunisation,

Red cell alloimmunisation: the blood group systems, pathophysiology and laboratory testing for Rhesus and other red cell antigens

The neonatal implications of anaemia, hyperbilirubinaemia and hydrops

The organisation & effectiveness of isoimmunisation screening and prevention programmes

The pharmacology of Anti-D immunoglobulin administration recognising when surveillance for fetal anaemia is indicated, and referral to a tertiary unit

Which red cell antibodies may cause haemolytic disease of the fetus and newborn, when and how surveillance for fetal anaemia should be instituted, and triggers for referral to a tertiary level unit capable of performing intrauterine transfusion

How MCA velocities are used to monitor signs of anaemia
Appropriately performs and interprets MCA Dopplers and other USG/Echo features suggestive of fetal anemia

Fetal Hydrops:

Recognises and evaluates the pregnancy complicated by Immune and non-immune hydrops

Recognises fetal hydropic change and constructs and investigates a differential diagnosis.

A differential diagnosis for non-immune hydrops, the need for tertiary referral and the range of investigations likely to be offered

Liases appropriately with the tertiary centre and multidisciplinary team.

Counsels women and their partners regarding the fetal risks, implications for the pregnancy and the long-term outcome

Amniotic fluid volume:

Defines, recognises, investigates and manages disorders of amniotic fluid volume.

Definition of oligohydramnios and polyhydramnios and the differential diagnosis

Placental disorders – USG:

Diagnoses and manages low lying placenta

Definition of placenta previa and how to make the diagnosis using ultrasound.

The risk factors for abnormal placental invasion and vasa praevia and how to diagnose them using ultrasound

Possible USG features suggestive of abruption placenta

Cervical assessment by USG:

Recognise when cervical length measurement should be offered and know the criteria for doing so accurately