Letter to the Editor

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Preventive Obstetrics and First Trimester of Pregnancy: One Stop Clinic Assessment of Risks (OSCAR)

Sarika Gautam*

Department of Obstetrics and Gynaecology, Pt. B.D.S. PGIMS, Rohtak, Haryana, India.

Correspondence to: Sarika Gautam, Department of Obstetrics and Gynaecology, Pt. B.D.S. PGIMS, Rohtak, Haryana, India.

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To the Editor:

One of the main indicators of societal health parameters is antenatal care. The main goal of antenatal care to identify various risk factors to mother or foetus or both and to provide positive pregnancy experiences and a healthy offspring.

There was no paradigm of early pregnancy evaluation in the 20th century since prenatal care was more concentrated on the third trimester and frequent visits were more near the end of pregnancy. Visits typically begin in the 16th week of the second trimester and continue through weeks 24, 28, fortnightly, and weekly beyond 37 weeks [1].

In order to detect foetal aneuploidies, foetal malformations, early screening for foetal growth limitation, preeclampsia, risk of miscarriage and stillbirth, and premature labour, the straight pyramid of antenatal care of antenatal care was inverted in 2011, with more focus on first trimester [2]. World health organization also revised their guidelines and recommended that first contact of antenatal care should be at 12 weeks of gestation i.e., first trimester of pregnancy.

In order to identify risk factors detailed maternal, past, obstetric, and family history with complete general and systemic examination to be done. It prompts us to decide if the mother, the foetus, or both are in danger, and it provides us with a railroad to choose which direction and order to do more studies [3].

With the advancements of ultrasonography and biochemical testing, the Inverted Pyramid concept allowed for the early discovery of abnormal pregnancy and provided an opportunity for obstetricians to further counsel couples about pregnancy risks.

Fetal aneuploidy is one of the major causes of perinatal morbidity, mortality, and disabilities in future life. Fetal aneuploidy combined test can be offered to the pregnant woman at 11 to 13+6 weeks which include nuchal translucency and PAPP-A and free beta hCG estimation and safely detect trisomy 21 more than 90 percent and trisomy 13 and 18 by 95%. Currently available test cell free fetal DNA estimation offer detection rate of trisomy 21 by 99%. There are evidences available that effectiveness of aneuploidy screening can be enhanced by inclusion of additional serum markers namely placental growth factor and MSAFP. The high cost of cf DNA test is the reason for its limited usage as a screening tool [2].

In the window of 11 to 13+6 weeks, ultrasonography may safely diagnose around half of the structural defects. Structure-related abnormalities are correlated with an increase in NT thickness. Prenatal treatment now includes detailed ultrasonography as a necessary component. A thorough examination of the posterior fossa allowed for the early identification of open neural tube abnormalities. Congenital cardiac problems are more likely to be discovered when NT measurements are combined with Doppler analysis of the tricuspid valve and ductus venosus [2].

As per ACOG committee opinion no. 700 accurate determination of dating of pregnancy is very important to improve fetomaternal outcomes. The most reliable way to determine or confirm gestational age is to measure the embryo or foetus using ultrasound throughout the first trimester (up to and including 13 6/7 weeks of pregnancy) [4].

Most of the placental formation and circulation establishment is finished by the end of the first trimester, and after 13 to 14 weeks of pregnancy, there are no changes in placental architecture or circulation. Abnormal placentation can cause maternal foetal complications in both early and advanced pregnancy. It lends credence to the idea that assessing placental circulation in the first trimester might assist uncover placental abnormalities. In order to lessen complications associated to placental malfunction, it also encourages the implementation of early treatment for pregnant women [1,2].

Preeclampsia and foetal growth restriction are the two main linked complications of placental dysfunction. According to a meta-analysis, if low-dose aspirin is started before 16 weeks of pregnancy, it may help lower the incidence of preeclampsia [1,2].

By evaluating the pulsatility index of the bilateral uterine arteries, placental dysfunctions may be screened in the first trimester. High resistance is predictive of the beginning of preeclampsia. Preeclampsia risk can be calculated according to the Fetal Medicine Foundation by integrating, maternal characteristics, previous obstetric history, mean arterial pressure, bilateral uterine artery pulsatility index, and biochemical indicators, namely Placental Growth Factor (PlGF) or PAPP-A if PlGF is not available. The risk of preeclampsia is calculated using above markers and certain ultrasonographic features. Pregnant women at risk of preterm preeclampsia (37 weeks) may be identified thanks to the advantages of first trimester screening. At a 10% screen positive rate, combined screening may accurately predict 90% of preterm PE and 75% of early preterm PE. For white women, the risk cut-off is 1 in 150 [2].

Small for gestational age screening can be predicted on the calculation combined with maternal characteristics, previous history, and values of mean arterial pressure and PlGF. Additional biochemical markers are PAPPA and A Disintegrin And Metalloproteinase 12 (ADAM-12) are seen associated and low levels are suggestive of SGA. At 10% false positive rate maternal characteristics and MoM values of biochemical markers can detect 75% preterm SGA and 45% beyond term i.e., 37 weeks [2].

In addition to PAPPA and free serum beta hCG, maternal biochemical serum indicators such as adiponectin, Sex Hormone Binding Globulin (SHBG), and visfantin can also be used to screen for Gestational Diabetes Mellitus (GDM). These markers are associated with the early identification of GDM. PAPPA, S-hCG, adiponectin, and SHBG were shown to be up when visfantin was on the decline [1]. Maternal features and serum indicators can identify 75% of pregnancies that will go on to develop GDM in the future with a 20% FPR, according to a calculator on the FMF website [5].

The detection of foetal macrosomia also provides encouraging data in trimester one. Increased NT measurement, higher levels of maternal serum free beta-hCG and PAPP-A, and lower levels of adiponectin all enhance the risk of LGA [1,2].

It is known since 20th century that multifetal gestation determination can be done with better certainty in first trimester and if reduction is needed that can also be instituted safely in late first trimester.

Therefore, if an antenatal case is presented to a healthcare professional, they should be fully informed of the significance of first trimester screening in addition to prenatal counselling. It is imperative to offer multidisciplinary approach i.e., One Stop Clinic Assessment of Risks Approach (OSCAR) [6].

It is good practice to take detailed maternal and previous obstetrical history with ultrasonography for NT measurement and detailed anatomic scan for detection of fetal anomalies. They should offer biochemical screening and combined testing should be done to assess the risk of aneuploidies and other risks like preeclampsia, FGR, GDM, macrosomia.

Because of this, the inverted pyramid of prenatal care provides a window of opportunity to classify pregnancy into several risk categories, including low risk mother and low risk foetus, low risk mother and high-risk foetus, high risk mother and low risk baby, and Both at high risk.

One Stop Clinic Assessment of Risks (OSCAR) allows healthcare providers the chance to provide expectant mothers with personalised care plans.

Conflict of Interest

The authors declare no conflict of interest.

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