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Antenatal care: paradigm changes over the years

The concept of antenatal care is not new. Aristotle (384 - 322 BC) had advised "change the figure and place the head so that it may present at birth" (External Cephalic Version - ECV). As early as 340 AD, expectant women in Sri Lanka had been admitted to maternity homes at term but there is no record of any antenatal care at the time. In 1540 Thomas Raynald has had a chapter on 'Ailments in Pregnancy' in his book entitled 'Byrth of Mankynd'. In the mid 18th Century, in Paris, pregnant women at term, or in preterm labour or with any illnesses, and unmarried women with poor family support, irrespective of the gestational period, were admitted to 'receiving homes' to await delivery. Vaccination against small pox, and ECV for breech or shoulder presentations, were also advised. In 1899 a pre maternity home, to cater for unmarried pregnant girls, was established in Edinburgh. During these early years of antenatal care the emphasis was to prevent maternal deaths especially due to eclampsia and difficult labours resulting from malpresentations and major fetal anomalies, to prevent preterm births and low birth weight babies, and reduce fetal and neonatal deaths. No other formal preventive care was provided. The focus was on women who could not afford to pay the fees of private physicians.

Domiciliary antenatal visits by community nurses, was first commenced in Boston, USA in 1901, and in May 1911, a pregnancy clinic was established in the Boston Lying-in Hospital. The commencement of an antenatal clinic at De Soysa Lying-in Home in Colombo in 1921was probably the first in Asia. After the establishment of the first Health Unit in Kalutara in 1926, preventive health services in Sri Lanka were gradually extended to the rest of the country. Antenatal care coverage in Sri Lanka is currently 99% and is provided by consultant obstetricians and gynaecologists in tertiary care centers and by public health midwives and medical officers of health in the primary health care centers. Improving the quality of antenatal care and achieving 100% coverage is targeted for 2016 [1].

The traditional model of antenatal care consisting of approximately. 14 clinic visits, concentrated mainly during the third trimester to screen for complications which are commoner during late pregnancy, has been followed in Sri Lanka for several decades. The introduction of mid trimester ultrasonography, repeated later if indicated, revolutionised antenatal care in specialist centers in Sri Lanka from the 1980s. However even now, ultrasonography is not routinely offered to all pregnant women in Sri Lanka. About a decade ago, a goal-oriented, four visit model was recommended as being equally effective for low risk women [2]. Later it was shown that women are less satisfied with four to nine visits, and such models have an approximately. 15% increased risk of perinatal mortality especially due to still births [3]. The new antenatal care model for Sri Lanka described in 2012 involves nine scheduled visits [4].

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A new model of antenatal care based on a comprehensive assessment including ultrasonography at 11-13 weeks, has been recently proposed. This involves 3-4 shared care clinic visits for low risk women with tailor made closer surveillance of high risk women in specialist centers [5].

Antenatal classes

During their antenatal clinic visits, pregnant women and their partners should be provided with adequate, evidence based information, to enable them to understand the antenatal and delivery management plans, to be actively involved in decision making, be aware of early warning signs of possible complications, and be prepared for labour, childbirth and care of the neonate. They also need advice, counseling and emotional support by family members, friends and health care providers [6]. Nutritional advice and balanced energy/protein supplements should be given. However high protein supplements for pregnant women and energy/protein restriction for overweight pregnant women, are not recommended [7]. Pelvic floor muscle training is recommended antenatally as well as postnatally, to reduce the risk of urinary and fecal incontinence during late pregnancy and after child birth [8].

Routine screening

At the booking visit, all pregnant women should have the following investigations: blood grouping and Rh, VDRL, full blood count (FBC), urine full report (UFR), urine for culture and antibiotic sensitivity, rubella antibodies and HIV antibodies (in high risk populations). The FBC and UFR should be repeated between 28-30 weeks.

Comprehensive assessment and ultrasonography at 11-13 weeks gestation

Routine ultrasonography between 11 and 13 weeks gestation is recommended to accurately determine gestational age and to determine chorionicity of multiple pregnancies [5,9]. If it is difficult to determine chorionicity of a multiple pregnancy, it should be managed as a monochorionic pregnancy and be followed-up with two weekly scans from 16 to 24 weeks to screen for twin transfusion syndromes. Four weekly growth scans from 28 weeks is recommended for all multiple pregnancies [10].

At 11-13 weeks' gestation, it may be possible to identify up to 90% of all major aneuploidies, and define patient-specific risks for miscarriage and stillbirth, preterm delivery, hypertensive disorders, a small for gestation fetus, gestational diabetes mellitus and fetal macrosomia, by a combination of maternal factors and biomarkers, and ultrasonography including maternal uterine artery Doppler studies [5,11].

Screening for fetal anomalies

If termination of pregnancy (TOP) is legally permitted, the 'combined test' is recommended to screen for Down syndrome between 11 and 13 weeks gestation [11]. Later in pregnancy, the biochemical 'quadruple test' should be offered between 15 to 22 weeks gestation [12]. Ultrasonographic screening for structural anomalies is usually carried out between 18 to 20 weeks gestation [13] and offers information that may help in better birth preparation for an affected child, arranging rapid access to specialist surgical or medical care at delivery, optimum palliative care in the newborn period, or the possibility of considering TOP (if it is legally permitted).

Screening for diabetes mellitus in pregnancy

There is no consensus on the optimal strategy to screen for diabetes mellitus in pregnancy. A cost effective and rational approach for Sri Lanka could be a two hour 75g glucose challenge test (GCT) [14] offered to all women (excluding known diabetics) at the 11-13 week visit (irrespective of the fasting state) and if normal (< 140 mg/dl) repeating it between 26-28 weeks. As women with a history of GDM are recommended screening in mid pregnancy [15] an additional GCT should be offered to them around 20weeks and if negative it could be repeated at 26-28 weeks. If a 75g oral glucose tolerance test is used to screen for GDM, the diagnostic criteria defined by the American Diabetes Association should be adopted [16]. Diabetes mellitus detected during pregnancy by the GCT or the OGTT should be managed with dietary modifications, metformin or insulin, depending on a blood sugar profile.

Preterm birth

Most women with spontaneous preterm births have neither risk factors nor a previous history of preterm birth. Therefore, no routine screening is recommended. Any genital infections should be identified and treated early. Women with a previous preterm labour could be offered two weekly trans-vaginal cervical length measurements and treatment with vaginal progesterone 200 mg daily from 17 weeks gestation [17]. A cervical cerclage could be offered if the cervix is < 25cm [18].

Placenta praevia

Any woman whose placenta extends over the internal cervical is at the 18-20 week scan should have another transabdominal scan at 32 weeks and if this is unclear, a transvaginal scan should be offered [19]. Evidence of morbid adherence of placenta should be looked for.

Fetal growth and well-being

In addition to palpation of the pregnant uterus, the symphysio fundal height (SFH) should be recorded at each visit from 24 weeks until delivery [20]. The use of SFH charts customised according to ethnicity, parity and body mass index have been shown to be have better predictive values in the detection of fetal growth restriction. Therefore, until SFH charts appropriately customised (eg. for BMI) are developed for Sri Lanka, the customised SFH charts used for Indians in the UK or the gestational age + 2 to 3 cm chart should be used to monitor fetal growth clinically [21]. All women with a high risk of having a Small for Gestational Age fetus should have serial ultrasound assessments including Doppler studies from 24 weeks gestation [22].

In centers with limited resources, outpatient fetal monitoring using a daily fetal movement chart from 34 weeks (high risk women) and from 37 weeks (low risk women) is recommended, although this may increase hospital admissions. Auscultation of the fetal heart confirms that the fetus is alive and reassures the mother, but is unlikely to have any predictive value.

Antenatal supplements

If the prevalence of anaemia among pregnant women is >20%, all pregnant women should be given a daily supplement containing 60 mg iron and 0.4 mg folic acid throughout pregnancy, starting as early as possible [23]. This has been practiced in Sri Lanka for several decades. Recently, a weekly supplement of iron 120 mg and folic acid 2.8 mg has been recommended for non anaemic pregnant women if the prevalence of anaemia among pregnant women is < 20% [24].

As high dose calcium supplementation has been recommended for women at increased risk of pre eclampsia and women with low dietary calcium intake [25], the current once daily antenatal calcium supplementation regimen practiced in Sri Lanka for several decades, should be changed to a twice daily regimen. Since calcium inhibits absorption of iron, calcium and iron supplements should not be given together [26]. Women with a high risk of preeclampsia should also be given 75 mg of aspirin daily from 8- 12 weeks until the birth of the baby [27].

Breech presentation at term

ECV which had been extensively practiced for centuries was recommended to be abandoned in the 1980s. However in the 21st century, based on robust scientific evidence, ECV is recommended again (unless there is a specific contraindication for it) for all women who have an uncomplicated singleton breech pregnancy at 36 weeks [19].

Pregnancy after 41 weeks

Induction of labour (IOL) is recommended for women who are known with certainty to have reached 41 weeks gestation. However as Asian women may have shorter periods of gestation compared to Caucasians, and maternal complications could increase after 40 weeks gestation in low risk women, IOL may need to be considered earlier in some Asian women, especially if utero placental insufficiency is suspected [28].

In conclusion, the traditional model involving approx 14 antenatal clinic visits has recently been reduced to a nine week model. A mid trimester scan and later scans as required, was introduced in specialist centers in the 1980s. This model needs to be changed to include two comprehensive assessments in a specialist clinic between 11-13 weeks and 18-20 weeks. Early booking with the PHM at < 8 weeks gestation for all, and shared care up to 34-36 weeks gestation for low risk women, should be encouraged. High risk women should be followed up appropriately in the specialist clinics.

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