First trimester maternal serum biochemical markers and the prediction of adverse pregnancy outcomes in Chinese population

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Introduction
In the first trimester of pregnancy the placentally derived biochemical markers pregnancy-associated plasma protein A (PAPP-A) and beta-human chorionic gonadotropin (beta-hCG) are used in conjunction with the ultrasound measurement of nuchal translucency thickness as part of screening programs for aneuploidies. Women who are found to have markedly reduced PAPP-A in the first trimester are increasingly being recognized as at an increased risk of other pregnancy complications. Such adverse outcomes include miscarriage, preterm delivery, small for gestational age infants, poor Apgar scores, neonatal intensive care unit (NICU) admission or stillbirth. The results regarding beta-hCG and other pregnancy complications are however more controversial. The association between PAPP-A or beta-hCG and various adverse obstetric outcomes has been explained by the fact that both hormones are produced in the placenta soon after implantation, and that low levels could possibly reflect abnormal placentation. This may in turn account for or be associated with increase obstetric and neonatal outcome. However, similar studies have not been reported within the Chinese population especially it is well known that the normal range of serum markers varies among different populations.

Objectives
The aim of this study was to assess whether low levels of PAPP-A or beta-hCG measured as part of the first trimester screening for chromosomal aneuploidies, were related to an increased risk of adverse pregnancy outcomes within Chinese population. These results can guide us in the counseling and increased fetal surveillance for this group of women, so as to improve our patient's care and safety.
**Methodology**
A retrospective review of all singleton pregnancies with first trimester Down's screening by a combination of fetal nuchal translucency thickness, maternal serum pregnancy-associated plasma protein A (PAPP-A) and beta-human chorionic gonadotropin (beta-hCG) done at 11+0 to 13+6 weeks' gestation in Queen Elizabeth Hospital from 1st July 2010 to 31th December, 2011 was conducted. The associations between abnormal biochemical markers and adverse pregnancy outcome including small for gestational age, preterm deliveries, low Apgar score, neonatal intensive care unit admission rate, miscarriage and stillbirth were studied.

**Result**
A low PAPP-A level was significantly associated with an increased rate (odd ratios) of small for gestational age babies (4.8; 95% CI, 2.8-8.2), preterm deliveries (2.0; 95% CI, 1.3-3.2), NICU admission (3.1; 95% CI, 1.8-5.3) and stillbirth (7.6, 95% CI, 2.0-29.1). On the other hand, a low beta-hCG result was not associated with any of these adverse outcomes.