

## **Enhanced twin pregnancy detection within an open neural tube defect and Down syndrome screening protocol using free-beta hCG and AFP.**

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We have applied our multimarker approach of maternal serum alpha-fetoprotein (AFP) and free-beta human chorionic gonadotropin (hCG) for Down syndrome screening to multiple gestations to assess its efficacy for improved detection of twin and triplet pregnancies. This study matched 225 cases of twin pregnancy and 39 cases of triplet pregnancy each with ten singleton pregnancies based on gestational week, race, time to receive sample, time of year of sample, and geographical area. The ratios of the MOM for each group at the tenth, 50th, and 90th percentiles were compared by the Wilcoxon test. Risks for twins were calculated using Bayes' rule, the age-related incidence of twins, and the levels of AFP and free-beta hCG. The tenth, 50th and 90th percentiles of free-beta hCG MOMs in twin and triplet cases were 0.85, 1.99, and 4.51, and 1.38, 2.78, and 4.07, respectively. For AFP, the MOMs at these percentiles were 1.26, 1.91, and 2.99, and 2.02, 2.68, and 5.30, respectively. The twin and triplet distributions for each marker were statistically significantly different from the singleton distributions ( $P < 0.0001$ ) and from each other ( $P = 0.0012$ ). At a twin risk cut-off of 1 in 50, 77.4 per cent of all twin gestations can be detected in a second-trimester AFP and free-beta hCG screening protocol with 5.1 per cent of singleton pregnancies falsely identified as at risk for twins. Our dual marker protocol for mid-trimester pregnancy screening combining AFP and free-beta hCG can identify over 77 per cent of twin pregnancies in women less than 35 years of age. This benefit may contribute to an improved outcome of pregnancy by early detection of multiple gestation.