

The association between second trimester unexplained maternal serum AFP levels (≥ 2 MoM) and pregnancy complications

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Objective

To determine the association between 'unexplained' elevation of maternal serum alpha-fetoprotein (MSAFP) levels in the second trimester of pregnancy and adverse maternal/fetal outcome.

Methods

We linked the records of 11654 women who participated second trimester triple test screening at Dr. Zekai Tahir Burak Women Health and Research and Education Hospital, between 1st of January 2008 and 31st of December 2009. The study group included the pregnant women who had MSAFP corrected MoM levels ≥ 2 MoM in the triple test and this elevation cannot be explained with multifetal pregnancies, fetal anomalies, fetomaternal hemorrhage or chromosomal abnormalities. Of these 11654 pregnant women, 243 had MSAFP levels ≥ 2 MoM in triple test. After ultrasound was performed in these 243 pregnant women, 5 had multifetal pregnancy, 13 had a fetal anomaly and 5 had haematoma so that 21 patients were excluded from the study group. Also we could not access the records of 52 women and these were excluded too. After the exclusion criteria, 170 pregnant women who had unexplained MSAFP levels ≥ 2 MoM comprised the study group. The control group was selected from the single pregnancies who had not fetal anomaly or chromosomal abnormality and the MSAFP, hCG and uE₃ corrected MoM levels in triple test were in normal range (MSAFP 0, 75-2, 0 MoM, hCG 0, 5-2, 0 MoM and uE₃ $\geq 0, 75$ MoM) between the same dates. All the parameters (MSAFP, hCG ve uE₃) were normal in 6760 pregnant women with 15% randomized sampling rate to select a minimum of 7 controls for each case in the study group, 1014 pregnant women out of 6760 were selected. 7 patients were excluded from the control group because of fetal anomaly and twin gestation. 1007 pregnant women comprised the control group. The statistical analysis was performed by Student's t-test, Mann Whitney U test, chi-square test, univariate logistic regression analysis and odds ratio calculation. The sensitivity, specificity, positive predictive value and negative predictive value for AFP were calculated too. $P < 0, 05$ was considered statistically significant.

Results

We found that women with unexplained elevated levels of MSAFP in the second trimester of pregnancy had increased risk of preterm birth (OR: 5, 547, %95 GA: 3, 298-9, 331, $p < 0, 001$), PPRM (OR: 4, 550, %95 GA: 2, 186-9, 469, $p < 0, 001$), IUGR (OR: 4, 565, %95 GA: 2, 640-7, 895, $p < 0, 001$), intrauterine fetal death (OR: 13, 953, %95 GA: 6, 199-31, 407, $p < 0, 001$), oligohydramnios (OR: 13, 953, %95 GA: 6, 199-31, 407, $p < 0, 001$) and placental abruption ($p = 0, 021$). No statistically significant correlations were found between unexplained high MSAFP level ($\geq 2, 0$ MoM) and placenta praevia ($p = 0, 268$) and pre-eclampsia ($p = 0, 586$).

Conclusion

Unexplained elevation of MSAFP levels in the second trimester of pregnancy is associated with an adverse maternal/fetal outcome. Due to low sensitivity and positive predictive value, AFP is far from being a screening test to predict the pregnancy complications. These patients need increased surveillance antenatally in order to improve the maternal/fetal outcome and consequently perinatal morbidity and mortality. Combining AFP with other serum markers (esp; hCG) and uterine artery doppler flow analysis could increase the prediction of pregnancy complications.