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Biochemical examinations of amniotic fluid in mid-trimester pregnancies with unexplained abnormal maternal serum double marker screening

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Objective : To investigate whether biochemical levels of amniotic fluid change in unexplained abnormal maternal serum double marker screening in mid-trimester pregnancies.

Methods : Amniocenteses were done between 16-20 weeks of gestation from women at age 35 or more(group 1; n=40), pregnancies with high risk for neural tube defects in maternal serum double marker screening(alpha-fetoprotein and free β-hCG)(group 2; n=40), and high risk for Down syndrome in screening (group 3; n=40). Levels of biochemicals in amniotic fluid were measured by autoanalyzer(Hitachi 736.200 Japan)(calcium, phosphorus, glucose, BUN, creatinine, uric acid, cholesterol, protein albumin, aminotransferases, alkaline phosphatase, γ-glutamyl transferase, total bilirubin, electrolytes, triglyceride, and high density lipoprotein). Statistical analysis was done by ANOVA.

Results : No one was complicated with fetal chromosomal abnormality or structural anomaly. There were no differences in the levels of calcium, phosphorus, creatinine, uric acid, aminotransferases, alkaline phosphatase, and γ-glutamyl transferase among 3 groups. Amniotic fluid levels(mean±SD) of the other chemicals in each group are presented and compared in the following table.

Chemicals	Group 1	Group 2	Group 3	p-value
Glucose(mg/dL)	49.42±10.33	42.99±13.74	43.90±10.50	0.0324[a]
BUN(mg/dL)	10.49± 2.24	8.58 ± 3.43	9.48 ± 2.08	0.0077[b]
Cholesterol(mg/dL)	2.12 ± 0.85	2.86 ± 1.54	1.82 ± 0.91	0.0007[b]
Protein(g/dL)	0.41 ± 0.16	0.63 ± 0.24	0.44 ± 0.19	0.0001[b]
Albumin(g/dL)	0.36 ± 0.14	0.50 ± 0.14	0.36 ± 0.14	0.0001[b]
Bilirubin(T)(mg/dL)	0.16 ± 0.07	0.19 ± 0.08	0.14 ± 0.04	0.0025[b]
Na(mEq/L)	135.7± 6.2	130.0± 15.5	137.2± 7.6	0.0072[b]
K(mEq/L)	3.9 ± 0.2	3.7 ± 0.5	3.9 ± 0.3	0.0206[b]
Cl(mEq/L)	114.1± 4.8	108.8± 12.7	114.9± 6.1	0.0036[b]

a: compared 1 with 2,3
b: compared 2 with 1,3

Conclusion : Fetal/maternal interface of unexplained high risk group for neural tube defect by maternal serum screening may have different transport and/or excretory systems comparing to those of old age group and unexplained high risk group for Down syndrome. However, it remains to be investigated whether amniotic fluid chemicals are correlated with either alpha-fetoprotein or free β-hCG.

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Prognostic Factors in Women with Elevated Second-Trimester Serum Alpha-Fetoprotein Levels

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Objective: To identify the subgroup of women with elevated serum AFP destined to have pregnancy outcomes

Methods: The study group consisted of women with singleton pregnancies and second-trimester serum AFP $\geq$ 2.0 MoM. Women with normal second-trimester serum AFP levels served as controls. They were follow up prospectively and stratified by placental ultrasonographic findings, degree and times of AFP elevations, and results of Kleihauser-Betke stain.

Results: In the study group, three subgroups were established based on ultrasound finding: women with placental sonolucent areas, women with subchorionic hematoma, and women of unexplained elevated serum AFP levels. Women with unexplained serum AFP $\geq$ 2.5 MoM were at increased risk for adverse pregnancy outcomes, but women with placental sonolucent areas were not. Multiple occurrence of elevated AFP was an indicator of pregnancy outcomes, but a positive Kleihauser-Betke stain was no associated with pregnancy complications.

Conclusion: For women with elevated AFP levels, comprehensive sonographic examinations should be recommended to detect fetal and placental anomalies. Placental sonolucencies seem to relate to uneventful outcomes. Only in cases with unexplained serum AFP > 2.5 MoM or persistently elevated AFP levels is at statistically significantly increased risk for adverse pregnancy outcomes