

INTRODUCTION

Pregnancy-associated plasma protein-A (PAPP-A), a screening test on the first trimester, has been reported to be associated with placentar development, fetal growth and retardation. In this study, we aimed to demonstrate the relationship between first trimester only low PAPP-A level and postnatal neurological development. But whose combined tests; first trimester screening and second trimester screening tests were normal.

MATERIALS and METHODS

PAPP-A levels of 1098 mothers measured on the first trimester between 1 January-31 December 2019 in Gynecology and Obstetrics Clinics were retrospectively collected. 387 of them were followed up in our Gynecology and Obstetrics Clinics. Newborns with a gestational age of <37 weeks, birth weight <2500g, newborns requiring resuscitation or hospitalized in the neonatal intensive care unit and with chromosomal abnormality were excluded from the study.

Among 307 mother who were eligible for the study, 149 agreed to participate. The neurodevelopmental status of the children was determined according to the DENVER Developmental Screening Test-II. First trimester PAPP-A values were compared as below and above 0,4 MoMs.

RESULTS

Neurodevelopmental delay was observed in 34/149 children based on DENVER Developmental Screening Test-II.

Table 1: Demographic features of the patients

Variabilities	n: 149
Mean mother age	29,55 y
Mean gestational age	39,33 w
Mean birth weight	3230 g
Gender M/F	72/77 (48,3/51,7 %)
Type of birth VB/CB	93/56 (62,4/37,6 %)

While the PAPP-A level of the mothers of 9 (26,5%) of 34 babies was >0,4 MoMs, the PAPP-A level of the mothers of 25 (73,5%) was found to be <0,4 MoMs. A statistically significant difference was found between these two groups.

Table 2: Association with neurological development level and maternal serum PAPP-A level

Neurodevelopmental delay	34 (22,8 %)
PAPP-A <0,4 MoMs	25 (73,5 %) (p<0,001)
Language development delay	34 (22,8 %)
PAPP-A <0,4 MoMs	25 (73,5 %) (p<0,001)
Motor development delay	34 (22,8 %)
PAPP-A <0,4 MoMs	25 (73,5 %) (p<0,001)
-Delay of 4 months holding head steady, unsupported	8 (23,5 %)
PAPP-A <0,4 MoMs	6 (85 %) (p=0,053)
-Delay of 9 months sitting without support	18 (52,9 %)
PAPP-A <0,4 MoMs	13 (72,2 %) (p=0,001)
-Delay of 1 year old taking a few steps without holding	6 (17,6 %)
PAPP-A <0,4 MoMs	5 (83,3 %) (p=0,002)

CONCLUSION

This is the first study that demonstrated the association between a prenatal screening test and postnatal neurological development. According to our results low plasma PAPP-A level on the first trimester could indicate the postnatal neurodevelopmental delay. It is especially predictive in the field of language development and motor development delay. Children with low maternal PAPP-A levels on the first trimester should be followed at pediatric neurology department.

REFERENCES

- Rosenbaum P, Dev Med Child Neurol 2007; 109(Suppl.): 8-14.
- Morris RK, Prenat Diagn 2017; 37: 253-65.
- Sirikunlai P, J Obstet Gynaecol 2016; 36: 178- 82.
- Peris M, Dev Med Child Neurol. 2021 Feb;63(2):183-189
- Lawrence JB, P Natl Acad Sci US 1999 Mar 16;96(6):3149-53
- Morris RK, Crossen JS, BMC preg childbirth 2008;8:33.
- Livrinova V, Maced J Med Sci. 2018 Jun 20; 6(6):1028-1031.