Relation of Elevated Serum AFP Levels with Preterm Labor in Kirkuk City-Iraq

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Abstract

In this study conducted in Kirkuk city in the period from February 2017 to the end of December 2017, which included 100 pregnant women who had regular contractions and/or short cervical cervices between 24 to 32 weeks of pregnancy and 100 healthy controls who did not suffer from complications Pregnancy and they were delivered on time. For the purpose of comparing the two groups with respect to the level of AFP. The study included collecting blood samples from both groups prior to birth to investigate and measure the level of the protein AFP in their blood. The study demonstrated that the lowest mean of cervical length and birth Wight were found in group with preterm labor as compared with the control group. The study revealed that the mean of AFP was elevated significantly in women with preterm delivery (17.7±2.11 pg/ml) as compared with the control group (8.23 ±1.67 pg/ml) at P. value <0.05. In this study, 40 of 100 of study cases delivered preterm (< 34 weeks).. The study found positive correlation of serum AFP with birth weight, birth head during 1st and 5th weeks of delivery (p< 0.01).

Keyword: *AFP, Preterm labour, Term Labour.*

Introduction

Virtually every publication about preterm birth (PTB) cites the profound impact PTB has on the babies, families and the healthcare system[(1)]. In Practice Bulletin 127 (June 2012), The American College of Obstetrician and Gynecologists (ACOG) states: "Preterm birth is the leading cause of neonatal mortality and the most common reason for antenatal hospitalization[(2)]. In the United States approximately 12% of all live births occur before term, and preterm labor (PTL) preceded approximately 50% of these preterm birthsm preterm births account for approximately 70% of neonatal deaths and 36% of infant deaths as well as 25–50% of cases of long-term neurologic impairment in children". These statistics magnify the importance of PTL contributing to 50% of PTB's[(3)]. When a patient presents to the hospital with regular uterine contractions and cervical change between 20 0/7 weeks and 36 6/7 weeks gestation with intact membranes, a diagnosis of PTL is made. Some factor or factors have caused a response of the myometrium (contractions) creating the risk of PTB[(4)]. Maternal serum alpha-fetoprotein (MS-AFP) is a second-trimester biochemical marker for prenatal screening. High or low MS-AFP suggests high risk of fetal open neural tube defects (ONTDs) or chromosomal aneuploidy, respectively[(5)]. Based on the decades' experience of prenatal screening, it has been reported in numerous studies that after excluding fetal ONTDs, women with elevated second-trimester MS-AFP have higher risk of APOs[(6-8)]. Therefore, it has been well known that second-trimester MS-AFP can be a biomarker for the predictions of APOs[(9)]. The aim of the study was to evaluate the role of maternal AFP levels with preterm and term delivery.

Material and Method

In this study conducted in Kirkuk city in the period from February 2019 to the end of December 2019, which included 100 pregnant women who had regular contractions and/or short cervical cervices between 24 to 32 weeks of pregnancy and 100 healthy controls who did not suffer from complications Pregnancy and they were delivered on time. The gestational age were determined by crown-rump length measured by ultrasound scan. In order to promote the first-trimester one-stop screening, we performed MS-AFP test additionally combining with ultrasonic measurement of intracranial translucency (IT) and detection of fetal structural abnormalities to study

the first-trimester screening of fetal ONTDs. The study included collecting blood samples from both groups prior to birth to investigate and measure the level of the protein AFP in their blood serum using immunofluorescence (i-chroma Korea). Through the study, patients were also monitored in terms of the consequences of early birth in terms of complications as well as birth weight.

Statistical Analysis: Computerized statistically analysis was performed using Mintabver 18.0 statistic program for determination of the*P.* value (P<0.05: significant).

Findings: The study showed no significant difference between preterm group (Cases) and term group regarding maternal age (P. value >0.05). The study also showed that the rate of regular contractions was 40% in patients group compared while no one of the control group was with regular contractions (P<0.01). The study demonstrated that the lowest mean of cervical length and birth Wight were found in group with preterm labor as compared with the control group (Table 1).

Table 1: General characteristics of the studied groups

Variables	Preterm Labor (n:100)	Control group (n:100)	P. value
Age (Mean±SD)	33.5±3.9	32.5±3.8	NS
Regular contractions	40 of 100	0 of 50	0.001
Cervical length (mm, median (minmax))	21 (5 - 47)	37 (26 - 52)	0.001
Birth weight (gm) (mean (range))	2659 (1862-3200)	3381 (3180-3535)	0.001

The study revealed that the mean of AFP was elevated significantly in women with preterm delivery (17.7±2.11 pg/ml) as compared with the control group (8.23 ±1.67 pg/ml) at P. value <0.05. Table 2.

Table 2: Relation of mannose binding lectin with preterm delivery

AFP level	Preterm delivery group	Control group
Mean	17.7	8.23
SD	2.11	1.67
No.	100	100

P. value: 0.041

In this study, 40 of 100 of study cases delivered preterm (< 34 weeks). In this subgroup, 12 mothers had histologically proven evidence of chorioamnionitis, and 10 of these patients additionally tested positive for funisitis. It is interesting to note that the levels of AFP in these 5 patients who tested positive for both Chorioamnionitis and funisitis were significantly reduced; (Table 3).

Table 3: AFP serum levels and pregnancy outcomes

AFP level	Benign outcomes	Chorioamniotis and funisitis
Mean	18.17	14.27
SD	2.22	2.16

P. value: 0.001

The study found positive correlation of serum AFP with birth weight, birth head during 1st and 5th weeks of delivery (p< 0.01), Table 4.

Table 4: Correlation of AFP serum levels with gestational age

Variable	by Variable	Spearman ρ	P. value
Serum AFP levels during 1st week	Birth weight (g)	0.41	0.001
	Weight at 4th week (g)	0.33	0.005
Serum AFP levels during 5th week	Serum AFP levels during 1st week	0.52	0.003

Discussion

The study showed no significant difference between preterm group (Cases) and term group regarding maternal age (P. value >0.05). The study also showed that the rate of regular contractions was 40% in patients group compared while no one of the control group was with regular contractions (P<0.01). The study demonstrated that the lowest mean of cervical length and birth Wight were found in group with preterm labor as compared with the control group. The study showed minor differences between the two groups in relation to the ricin protein, as it was relatively low in patients with early birth. Other studies also found that the levels of the AFP are positively related to the child's weight, height, and head circumference in the delivery period, and also found that there was a correlation with the child's weight and head circumference after a month of birth. It was concluded in other studies that the high level of acres was positively correlated with the weight of fetuses before birth (6-8). Moreover, the level of the iris in the blood correlates positively with the total weight of the fetus and its circular circumference as concluded by ultrasound (7). The results of our study are very similar to the results mentioned in the above-mentioned masses and his support for him, as it concerns the Moawad in the first month of their birth. Where previous studies confirmed that newborns represent low levels of serum ezine levels compared to infants during the first month of life (9), there is a significant difference between the first and second evaluation. Other studies conducted in different regions of the world indicate that the level of the iris of the eye was somewhat low compared to the control group in this research, previous studies on mature children showed that the levels of iris of the eye are generally higher compared to the results in our study (10)). We assume that we have detected low levels of the iris as our blood samples are collected directly from children, unlike previous studies in which bloodstream analyzes of the iris were likely to be affected by the maternal iris. In our study of serum iris levels during the fifth week of life were positively associated with the degree of birth weight, the score increased in 5 weeks, the head circumference Z score in 5 weeks unlike some previous studies (11). Many researchers believe that

AFP in serum levels in new children may be inherited (from parents) (12-14). According to earlier studies conducted earlier, the rates and concentrations of serum protein iris in new children, especially in the first month of their life, may be inherited from the mother through energy-regulating genes and in particular, the lipid protein linked to high-density cholesterol (15-18). Although this protein has not been taken as a differentiating factor in these radomas, which may be a hindrance to this research. However, we found that iris levels were positively related to the child's weight, height, and head circumference in the delivery period, Park *et al.* found in recent study that newborn mother in preterm labour have elevated AFP level especially who have significant child outcomes like chorioamninitis and fusinistis[19].

Conclusion

Serum level of AFP decreased significantly women with pretemlabour as compared with term ones

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Kirkuk Health Directorate and all experiments were carried out in accordance with approved guidelines.

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