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ORIGINAL RESEARCH

Assessment of maternal serum alpha-feto protein level in second trimester

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ABSTRACT

Background:Antenatal care provides numerous benefits that result from clinical and psychosocial interventions. By providing medical services, counseling and investigations, antenatal care can lead to improved health outcome for women and the fetus. The present study was conducted with the aim to assess maternal serum alpha-feto protein (MSAFP) level in second trimester.

Materials & Methods: The present study was conducted in the postgraduate department of Gynaecology and Obstetrics, Lalla Ded Hospital, Government Medical College Srinagar, over a period of one year. This study was conducted in 250 patients with their consent. Blood was taken for estimation of maternal serum alpha-feto-protein.

Results: Maximum patient were in the age group of 28-31 years i.e. 104 (41.6%) followed by 80 patients (32%) in the age group of 24-27 years followed by 35 (14%) patients in the age group of 32-35 years followed by 31 (12.4%) patients in the age group of 20-23 years. Primi was seen in 170, Para 1in 53 and >1 para in 27 patients. The mean of the maternal serum alphafeto protein (overall) was 65.32+33.95. The mean of the maternal serum alphafeto protein in pregnancies with normal outcome was 53.47+25.65. The mean of the maternal serum alphafeto protein in pregnancies with adverse outcome was 92.96+34.99.

Conclusion: Raised serum alpha-fetoprotein levels in second trimester in absence of neural tube defects can be a useful predictor for adverse pregnancy outcome.

Key words: alpha-fetoprotein, Primi, second trimester

INTRODUCTION

The objective of antenatal care is to ensure a normal pregnancy with delivery of a healthy baby from a healthy mother.[1] Evidence has shown that antenatal care provides numerous benefits that result from clinical and psychosocial interventions. By providing medical services, counseling and investigations, antenatal care can lead to improved health outcome for women and the fetus.[2] The overriding intention is to identify early which pregnancies are likely to have a complicated course or outcome.[3]

Over the years, a variety of other pregnancy outcomes have been associated with abnormal values of the maternal serum alpha-fetoprotein.[4] Unexplained high levels of maternal serum alpha-fetoprotein have been associated with an increased risk of adverse pregnancy outcome such as fetal death before the 28th week, perinatal death, low birth weight, preterm labor and other obstetric complications.[5] Also, a raised maternal serum level of AFP during the second trimester of pregnancy is one of the best biochemical predictors of unexplained stillbirth.

Alpha-fetoprotein, a tumor-associated fetal protein, has long been employed as a serum fetal defect/tumor marker to monitor disease progression. Alpha-fetoprotein was first identified in 1956 by Bergstrand and Czar in human fetal serum as an embryo specific protein.[6] The present study was conducted with the aim to assess maternal serum alpha-feto protein (MSAFP) level in second trimester.

MATERIALS & METHODS

The present study was conducted in the postgraduate department of Gynaecology and Obstetrics, Lalla Ded Hospital, Government Medical College Srinagar, over a period of one year. This study was conducted in 250 patients with their consent. Inclusion Criteria was patients age 20-35 years old and having single viable fetus appropriate for gestational age.Exclusion Criteria was multiple pregnancy and anatomically abnormal fetus when assessed by ultrasound and at delivery.

A thorough general physical and local examination was done. All routine investigations were done. Detailed ultrasonography was done to know the gestational age, placental localization, to rule out multiple pregnancy and congenital abnormalities. Blood was taken for estimation of maternal serum alpha-feto-protein. The data thus obtained was analyzed using statistical package for social sciences (SPSS) version 16.0.

RESULTS

Table I Age Distribution

Age group	No.	% age
20-23	31	12.4
24-27	80	32
28-31	104	41.6
32-35	35	14
Total	250	100

Table I, graph I shows that in our study the maximum patient were in the age group of 28-31 years i.e. 104 (41.6%) followed by 80 patients (32%) in the age group of 24-27 years followed by 35 (14%) patients in the age group of 32-35 years followed by 31 (12.4%) patients in the age group of 20-23 years.

Graph IAge Distribution

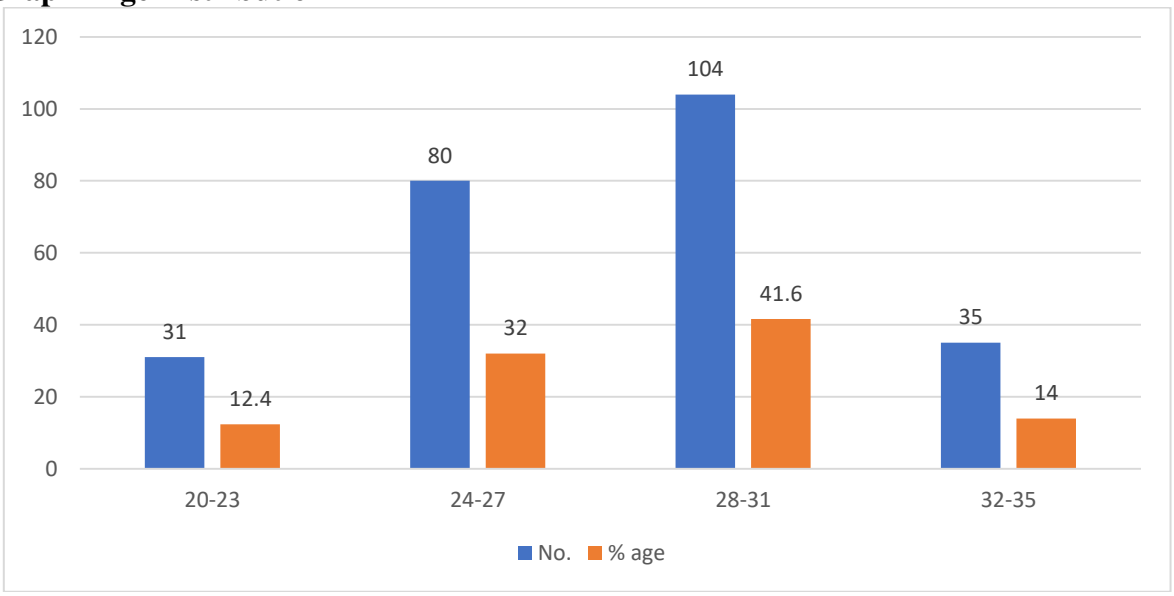

Table II Gravida of the patients

Gravida	Number	P value
Primi	170	0.01
Para 1	53	
>1 para	27	

Table II, graph II shows that Primi was seen in 170, Para 1in 53 and >1 para in 27 patients. The difference was significant (P< 0.05).

Graph IIGravida of the patients

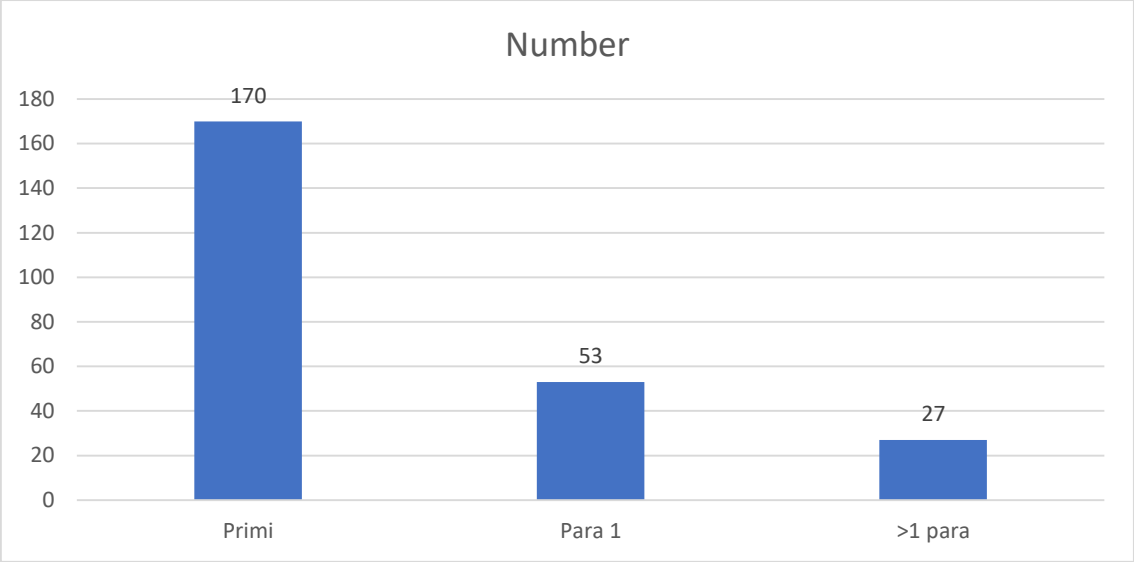

Table III Maternal serum alpha-feto protein level

Variable	No.	Mean	SD
MSAFP (Overall)	250	65.32	33.95
MSAFP (Normal Outcome)	175	53.47	25.65
MSAFP (Adverse Outcome)	75	92.96	34.99

Table III shows that the mean of the maternal serum alphafeto protein (overall) was 65.32+33.95. The mean of the maternal serum alphafeto protein in pregnancies with normal outcome was 53.47+25.65. The mean of the maternal serum alphafeto protein in pregnancies with adverse outcome was 92.96+34.99.

DISCUSSION

Alpha – fetoprotein is an oncofetal glycoprotein that is produced from the second month of pregnancy by the secondary yolk sac and from the third month by the fetal liver and gastrointestinal tract.[7] Unexplained elevations of maternal serum α-fetoprotein exist in approximately 1% of the obstetric population. A consensus has been reached that these women face an increased risk of adverse pregnancy outcome.[8] This prospective study was conducted at Lalla Ded Hospital, a tertiary care hospital in Kashmir valley.

250 antenatal women satisfying the inclusion criteria were included in the study. Maternal serum Alpha-fetoprotein levels were determined at 14-22 weeks of gestation and the patients were followed till delivery. The patients were managed as per our hospital protocol. In the present study the mean age of the patients was 27.5+3.34 years, minimum being 20 years and maximum being 35years. Observations made in the study were similar to the study done by Ayse Yasemin Karageyim et al[9] in which they found that the mean maternal age of the patients was 29.15+4.53 years. Hsu JJ, Hsieh TT assessed the relation of maternal age on the

maternal serum alpha-fetoprotein (AFP), during the second trimester. No significant association was found between maternal age and serum marker levels in their study.

We found that Primi was seen in 170, Para 1in 53 and >1 para in 27 patients. In the present study the mean gestational age of the patients at which serum alpha-fetoprotein levels were determined was 17 weeks. The minimum being 14 weeks and the maximum being 22 weeks. The mean of the maternal serum alpha-fetoprotein level was 65.32±33.95. The mean of maternal serum alpha-fetoprotein in pregnancies with normal outcome was 53.47±25.65 and in pregnancies with adverse outcome was 92.96±34.99. The pregnancies with adverse pregnancy outcome had higher values of maternal serum alpha-fetoprotein as compared to those with normal pregnancy outcome and conclusion drawn from the study was similar to the study done by Razieh Dehghani-Firouzabadi, Naeimeh Tayebi, Nasrin Ghasemi and Zahra Tahmasbi[10] where they concluded that unexplained high levels of maternal serum alpha-fetoprotein have been associated with adverse pregnancy outcome.

Zahra Sehat et al[11] studied the association between second trimester maternal serum biomarkers (Human Chorionic Gonadotropin, Alpha-fetoprotein, Non-conjugated estrogen, Inhibin A) and pre-term delivery. There was a direct relationship between preterm delivery and increase of serum alpha-fetoprotein level (p=0.011) and serum inhibin A level (p=0.03) and concluded that the increase in the serum alpha-fetoprotein and Inhibin A and decrease in Non-conjugated estrogen serum levels in the second trimester of pregnancy was associated with enhanced probability of preterm delivery.

Yaron Y et al[12] evaluated the value of all 3 common biochemical serum markers, maternal serum alpha-fetoprotein, beta-human chorionicgonadotropin and unconjugated estriol, and combinations thereof as predictors of pregnancy outcome and concluded thatincreased maternal serum alpha-fetoprotein levels (>2.5 multiples of the median) were found to be significantly associated with preterm delivery. Simpsons et al[13] suggested that persons with an unexplained maternal serum alpha-fetoprotein elevation at 15-20 weeks gestation are at increased risk for a variety of adverse perinatal outcomes like fetal death.

CONCLUSION

Authors found that raised serum alpha-fetoprotein levels in second trimester in absence of neural tube defects can be a useful predictor for adverse pregnancy outcome.

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