

Original article:

Study on consideration of serum progesterone as a marker for viability of early pregnancy

Dr. Anubhuti Yadav, Dr. Pragati Meena

¹3rd year Resident, Department of obstetrics and gynecology , National institute of medical science and research center , Jaipur

²Assistant Professor, Department of obstetrics and gynecology , National institute of medical science and research center , Jaipur

Corresponding Author: Dr. Pragati Meena

Abstract:

Background –Transvaginal ultrasound is best single diagnostic and prognostic test, which enables the visualization of early pregnancies, and help in diagnosing early pregnancy failure.

There are few conditions where both clinical and ultrasonographic findings were not conclusive e.g. patients who came with symptoms of threatened abortion or found to have a small, or empty gestational sac on scan, as no conclusive diagnosis can be given.

Aim objective:- To detect the relation between serum progesterone and viability of the pregnancy during the first trimester and correlate the relation of maternal age and gestational age from last menstrual period to serum progesterone levels.

Material and methods:-A random selection of pregnant females were done from obstetric indoor department at a tertiary care hospital. Study done on 100 pregnant patients from December, 2016 to December, 2017, it is a prospective type of study.

Results-100 pregnant women in first trimester were hospitalized either for vaginal bleeding or abdominal pain for this prospective study. The mean age of studied population was 22 years, the mean gestational age at progesterone assay was 8 weeks 3 days \pm 2 weeks. By the first trimester end pregnant women were classified into viable 69 pregnant group and of 31 non-viable group. The mean serum progesterone was significantly high in viable pregnancy group 43.15 ng/ml as in comparison to non-viable pregnancy group 9.98 ng/ml.

Conclusion-Serum progesterone can be considered as reliable marker for the early pregnancy failure.

Keywords – Serum Progesterone, viability, non viability.

Introduction

Transvaginal ultrasound is best single diagnostic and prognostic test, which enables the visualization of early pregnancies, and help in diagnosing early pregnancy failure. There are few conditions where both clinical and ultrasonographic findings were not conclusive e.g. patients who came with symptoms of threatened abortion or found to have a small, or empty gestational sac on scan, as no conclusive diagnosis can be given. C-21 steroid hormone is a progesterone which is secreted by granulosa cells of the ovary.

Progesterone hormone is important for promoting endometrial decidualization to prepare the uterus for implantation of the blastocyst and to maintain the pregnancy. Progesterone's physiological functions is inhibition of immune responses, like those involved in graft rejection and inhibition of smooth muscle contractility and Serum progesterone is a very powerful predictor in early pregnancy outcome in spontaneous conceptions. It is important to study women after natural conception without exogenous progesterone support, and the relation between serum

progesterone and viability of the first trimester pregnancy.

Aim & objective:-

1. To detect the relation between serum progesterone and viability of the pregnancy during the first trimester.
2. To correlate the relation of maternal age and gestational age from last menstrual period to serum progesterone levels.

Material and methods

Place of Study: Department of Obstetrics and Gynecology, National, Institute of Medical Science & Research, Jaipur.

Study Type: prospective type of study.

Study Period: December, 2016 to December 2017.

Sample Size: 100 pregnant women were taken who were admitted.

Sample Size: The sample size for this study was calculated by using the following formula:

$$N = \frac{4 p q}{L^2}$$

Results

100 women were hospitalized due to pain abdomen and vaginal bleeding during first trimester of their pregnancy were taken as study participants.

Inclusion criteria

Women who had early pregnancy and admitted in the obstetrics ward.

Exclusion criteria

Women who were not pregnant.

Methodology

All pregnant women were taken who admitted in the Department of Obstetrics and Gynecology with the complaints of bleeding p/v or pain abdomenduring the first trimester were selected for the study. The relevant parameters were recorded in a pre-structured questionnaire which includes identification data, demographic characteristics, socioeconomic data, parity, gestational age that to be calculated from 1st day of last menstrual period and history of any previous early miscarriages. In this study randomly 100 early pregnant women were taken after applying inclusion and exclusion criteria. Women included in the study were certain of dates, had conceived spontaneously with no history of infertility and had a positive pregnancy test.

Table no. 1:-Relation between serum progesterone levels and viability of pregnancy

Pregnancy outcome	Number	Serum progesterone
Viable pregnancy	69	10.2-78.9
Non viable pregnancy	31	2.22-23.37

In the end of the first trimester pregnancy were divided in the two group one for viable pregnancy and another for non viable pregnancy group. The mean of serum progesterone is significantly high in viable pregnancy group 43.15 ng/ml(10.2- 78.9ng/ml) while in non viable group average is 9.98 ng/ml (2.22- 23.37ng/ml)p- value 5.31624E-27 . This p value is very significant.

Table no.2:- Relation between serum progesterone levels and maternal age and gestational age according to LMP

Variables	Number	Serum progesterone
Maternal age		
>22 year	69	4.59-67.67
<22 year	30	2.22-78.9
Gestational age		
>10 week	22	7.66-67.78
<10 week	78	2.22-78.9

This table is showing the correlation of between the maternal age and serum progesterone levels 71 patients of more than 22 years having 4.59- 67.67 ng/ml of progesterone levels while in 30 patients serum progesterone level is 2.22- 78.9. The average value is 31.76.

P value is non significant.

Out of 100 patients 22 were > 10 week of gestational age were having 7.66-67.78ng/ml and 79 patients having 2.22- 78.9ng/ml serum progesterone level. The average value is 34.011.

P value is 0.19 which is non significant.

Discussion

As suggested by recent studies measurement of serum progesterone in early pregnancy is most single powerful pregnancy outcome in natural conceptions. This designed prospective study for detecting relationship between serum progesterone and viable pregnancy during first trimester.

100 pregnant women in first trimester were hospitalized either for vaginal bleeding or abdominal pain for this prospective study. The mean age of studied population was 22 years, the mean gestational age at progesterone assay was 8 weeks 3 days \pm 2 weeks. By the first trimester end, pregnant women were classified into viable 69 pregnant group and of 31 non-viable group. The mean serum progesterone was significantly high in viable pregnancy group 43.15 ng/ml as in comparison to non-viable pregnancy group 9.98 ng/ml. These viable group patients were having high level serum b-hcg, these patients were having no history of any previous miscarriages. Yolk sac was seen in ultra sonography in about one fourth patients.

Among the studied population, relationship between serum progesterone and the maternal age or gestational age or past history of early miscarriage was statistically insignificant.

95 pregnant women were of 13 weeks or less, recruited as study group. The control was of 14 pregnant women by Hanita and colleagues for determining role of serum progesterone as marker of early pregnancy failure after single assay. It was found a significant lower serum progesterone with non-viable pregnancy (10.7 ng/ml) in comparison to viable pregnancy (45.9 ng/ml). Hence, it was

concluded serum progesterone can be used as early pregnancy failure marker with cut off 32.7 ng/ml. It had 90% sensitivity with 75% NPV and 92% specificity with 97% PPV in diagnosing early pregnancy failure.

In a prospective comparative study by Al-Sebai et al for assessing role of single maternal serum progesterone for immediately diagnosing early pregnancy failure and for fetal viability as long term prognosis. 489 women presented with singleton pregnancy, vaginal bleeding with abdominal pain at 18 weeks. The levels of progesterone was significantly lower in non continuing and tubal pregnancy compared to threatened continuing groups with cut off value at 45 mmol/l for differentiating viable and non-viable pregnancies with 87.6% sensitivity and 87.5% specificity.

In the study conducted by Ioannidis and colleagues for investigating relationship between early progesterone assay and outcome of pregnancies undergoing IVF/ICSI and receiving rectal progesterone supplements. It had single progesterone assay on day 14 post-oocyte retrieval with higher among current pregnancy in comparison to women with abnormal pregnancy. Hence, it was concluded to have serum progesterone as single important indicator for pregnancy outcome among women undergoing IVF/ICSI treatment.

Conclusion

Hence, from the conducted study it can be concluded that serum progesterone can be considered as reliable marker for the early pregnancy failure. Therefore, it can be used to differentiate between the viable and non-viable pregnancy.

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