



ROLE OF SERUM INSULIN HORMONE LEVEL IN PREDICTION OF PREGNANCY OUTCOME IN WOMEN WITH EARLY PREGNANCY LOSS

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ABSTRACT **Introduction:** Early pregnancy loss occurs in both natural and in-vitro fertilization mediated pregnancies. Clinical miscarriages occur in 8% of pregnancies. Most clinically apparent miscarriages occur during the first trimester & etiology is often unknown.

Aim: To determine and compare the level of serum Insulin in cases of unexplained early pregnancy loss and previous normal pregnancies and to observe the association between level of serum Insulin and pregnancy outcome.

Methodology: This case control study was carried out on total of 77 pregnant women in first trimester attending outpatient department and indoor cases in Swaroop Rani Nehru hospital and Kamla Nehru Memorial hospital, Prayagraj over a period of twelve months from September 2018 to August 2019. Patients were divided in two groups: Group I (n=52) included women with history of previous abortion and Group II (n=25) included women with history of no previous abortions. Serum level of Insulin hormone was measured using enzyme-linked immunosorbent assay (ELISA) technique.

Result: In this study serum Insulin hormone levels were higher in cases with history of previous early pregnancy loss compared to control (p<0.0001) and their levels were higher in cases who aborted during the study than the women who had successful continuation of pregnancy.

Conclusion: Hyperinsulinemia was associated with early pregnancy loss. Estimation of the serum level of Insulin hormone could be used in cases of early pregnancy loss as a predictor of pregnancy continuation.

KEYWORDS : Hyperinsulinemia, pregnancy loss,

INTRODUCTION:

Early recurrent pregnancy loss is a growing problem all over the world. It occurs in both natural and in-vitro fertilization mediated pregnancies and is one of the most difficult areas in reproductive medicine because the etiology is often unknown and there are few evidence-based diagnostic and treatment strategies. The occurrence of early pregnancy loss affects 1-5% of couples. Clinical miscarriages occur in 8% of pregnancies. Most clinically apparent miscarriages (two-thirds to three-quarters in various studies) occur during the first trimester. Early pregnancy loss is a heterogeneous condition that has many possible causes including genetic, hormonal, metabolic, uterine, anatomical, infectious, environmental, occupational and personal habits, thrombophilia, or immune disorders. There is an increasing evidence that immunological factors play an important role in the failure of these pregnancies and cause early pregnancy loss. However, up to 50% of cases have a clearly defined etiology. Insulin hormone levels were higher in cases with history of previous early pregnancy loss compared to control (p<0.0001) and their levels were higher in cases who aborted during the study than the women who had successful continuation of pregnancy.

MATERIALS AND METHODS

Place of study: MLN medical college and SRN Hospital, Prayagraj

Duration of study: One year

Type of study: Case-control study.

Sample size: 77

Sample collection method: three millilitres of fasting venous blood sample was collected from patients in both groups

Inclusion criteria:

Criteria for selection of cases- All pregnant women with singleton pregnancy between 5 to 12 weeks of gestation with history of one or more miscarriage during natural or IVF-mediated pregnancy.

Criteria for selection of control- Women with previous two or more normal pregnancy with no history of abortion.

Exclusion Criteria:

1) Women with history of ectopic or molar pregnancy.

- 2) Woman with chronic disease or with chronic ongoing treatment.
- 3) Women with history of receiving any relevant hormonal treatment during or shortly before the current pregnancy.
- 4) Women with previous cervical cerclage and clinical evidence of genitourinary infection.

PROCEDURE

For serum Insulin level three millilitres of fasting venous blood sample was collected from patients in both groups under aseptic precautions by venepuncture, then put it in a clear plain test tube, after centrifugation, the separated serum was stored at -20 degree centigrade until use. 1st sample was taken at 5-8 week of gestation and second sample at 9-12th weeks of gestation. Serum level of Insulin hormone was measured using enzyme-linked immunosorbent assay (ELISA) technique. The mean absorbance for each standard, control and samples were calculated. The serum Insulin level of the controls and samples was determined from the standard curve by matching their mean absorbance readings with the corresponding human leptin concentrations. Follow-up of all patients was done up to 20 weeks to know the pregnancy outcome and documentation of abortion was done by ultrasound and histological examination, that occurred.

Statistical Analysis-

The unpaired 't' test or chi-square test was carried out for continuous and categorical variables respectively and descriptive statistics were given as the mean SD. For all statistical analysis p<0.05 was considered as significant.

RESULTS:

Out of total 77 pregnant women, 67.53% [52/77] had history of previous abortion and 32.46% [25/77] had no history of previous abortion at time of study (Table 1).

Table 1: Distribution of Cases

GROUP	Patients	Number	Percentage
I	Pregnant with h/o abortion	52	67.53%
II	Pregnant with no h/o abortion	25	32.46%
	Total	77	100%

Out of total patients 32.46% (25/77) women had no previous miscarriage, 10.28% (8/77) women had 1 miscarriage, 24.67% (19/77) had 2 miscarriage, 19.48% (15/77) cases had 3 miscarriage and 12.98% (10/77) had more than 3 miscarriage.

Table 2: Obstetric history

No. of Miscarriage	Number	Percentage
0	25	32.46%
1	8	10.28%
2	19	24.67%
3	15	19.48%
>3	10	12.98%
Total	77	100%

Among cases, the serum Insulin level at 1st sample (5-8 week) was 25.131±8.01; range (10.87- 31.19 microIU/ml) and in subsequent 2nd sample at 9-12 week the level was 32.92±9.44 range (12.28 – 44.6 microIU/ml). The difference in serum Insulin level was statistically significant (p<0.0001).

Table 3: Serum Insulin level in group I

Serum Insulin (micIU/ml)	Range (min- max)	Mean± SD	P- Value
At 5- 8 th week	10.87-31.19	25.131±8.01	
At 9-12 th week	12.28 – 44.6	32.92±9.44	<0.0001

The mean serum Insulin level in control group at 5-8th week was 18.096±6.657, range (9.83- 27.68 microIU/ml) and in next sample at 9-12 week it was 21.762±6.40; range (11.98-28.86 microIU/ml).

Table 4: Serum Insulin levels in group II

Serum Insulin (micIU/ml)	Range (min- max)	Mean±SD	P- Value
At 5 - 8 th week	9.83 – 27.68	18.096±6.65	
At 9-12 th week	11.98 – 28.86	21.762±6.40	0.0528

The mean serum Insulin level in aborted group was 27.223±8.192 and at 9-12 week 36.678±7.92. Serum insulin hormone were higher (p<0.0001) in cases who aborted during the study.

Table 5: Comparison of Serum Insulin levels in Aborted group

ABORTED GROUP (n=36)	Range (min- max)	Mean± SD
At 5- 8 th week	16.42-48.88	27.223±8.192
At 9-12 th week	21.47- 51.1	36.678±7.92
P-value		<0.0001

DISCUSSION

In present study, majority of pregnant women (32/52) with previous miscarriage had higher serum Insulin level. The mean serum Insulin level in Group I at 1st sample was 24.78±7.321 (range-10.87-31.19 microIU/ml) and in 2nd sample at 9-12 weeks it was 31.896±9.036 (range-12.28 – 44.6 microIU/ml).

The mean serum Insulin level in women with no history of miscarriage at 5-8th week of gestation was 18.825±8.714 (range 9.83 – 27.68 microIU/ml) and in subsequent sample at 9-12 week it was 23.893±9.872 microIU/ml (range 11.98 – 28.86) with no significant difference (p=0.0602)

In the present study, 32 patients (61.53%) in group I and four patients (16.0%) in Group II aborted during study. Twenty patients (40.38%) in group I completed 20th week of gestation compared to twenty-one patients (84%) in group II.

In aborted group, higher serum Insulin levels (>26.0) were found in 32 cases (61.53%) in group I and 13 patients (52.0%) in group II [Table 26, figure 27].

Six patients (11.53%) in group I and three patients (12%) in group II had higher serum Insulin levels in both 1st and 2nd sample and completed 20 weeks. On the other hand, the aborted cases that showed higher level insulin in both first and second sample were 8 (15.38%) and 3 (12%) in the Group I and Group II respectively.

CONCLUSION

In conclusion, serum insulin hormones levels were higher in cases with history of previous early pregnancy loss and their levels were higher in

cases who aborted during the study. early pregnancy loss is associated with endocrine abnormalities where serum insulin levels increase in a different way from the increased levels in normal healthy pregnant women. Since insulin elevation during pregnancy seems to be affected by the same process that stimulates leptin production from adipocytes, it may serve as markers for detecting and monitoring pregnancy complications specially if cases of abortions have no specific medical cause for pregnancy loss, and can be termed as idiopathic or unexplained abortion.

Generally, since most pregnancy losses occurred during the first trimester, it is highly recommended that Insulin, hormone evaluation tests are provided within 12 weeks of gestation to prevent pregnancy loss. Estimation of the serum level of insulin hormones could be used in cases of early pregnancy loss as a predictor of pregnancy continuation. Further studies are needed to confirm these results.

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