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PRE-ECLAMPSIA;
LEPTIN IN PRE-ECLAMPSIA IN THIRD TRIMESTER OF PREGNANCY A HOSPITAL BASED TRIAL

Dr. Anwar Khan[1], Dr. Hamzullah Khan[2]

1. Assistant Professor, Department of Physiology, Nowshera Medical College
2. Assistant Professor, Department of Hematology Nowshera Medical College

Correspondence Address:
Dr. Anwar Khan
Assistant Professor
Department of Physiology
Nowshera Medical College

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ABSTRACT… Objectives: To determine the relation of leptin, hypertension and body mass index with pre-eclampsia in the 3rd trimester of pregnancy in a hospital based study. **Design:** descriptive observational study. **Setting:** three teaching hospital of Peshawar, Khyber teaching hospital, Hayatabad medical complex and lady reading hospital Peshawar. **Duration:** June 2012-dec 2012. **Inclusion criteria:** all women in their third trimester without any co-morbidity. **Exclusion criteria:** were all diabetic and first and 2nd trimester pregnant ladies. **Procedure:** relevant information on height, weight, body mass index (BMI), pulse, blood pressure and leptin were recorded on a predesigned questionnaire prepared in accordance with the objectives of the study. Data was analyzed in MS-Excel. **Results:** A total of 80 pregnant ladies included. Majority of the patients were in the age range of 17-26 years of age. Maximum number 30(37.5%) of patients were in weight ranging 66-75 kg. We observed maximum number of patients were normotensive systolic BP 110-130mmHg (47%). About 43% of patients had BP>140mmHg up to 200mmHg. 6% had Diasatolic BP between 130-140mmHg. 23.5% had BMI>32.6. 38% had BMI between 27.62-32.62. We observed that majority of the patients were in the leptin serum range of 229.57-329.57. 7.75% had serum leptin level above 329 with a maximum of 829.6 in one patient at top in data. **Conclusion:** Serum leptin level in pregnancy increases in third trimester with a determined relation of serum leptin level with gestaional hypertension and pre-eclampsia.

Key words: pregnancy, BMI, Serum Leptin Level, pre-eclampsia.

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INTRODUCTION

Leptose, meaning thin. Leptin is secreted by white adipose tissue that is primarily involved in regulation of food intake and energy expenditure. Serum leptin levels during pre-eclampsia are strongly associated with total cholesterol whereas association with other variables is insignificant. With severity of pre-eclampsia when leptin level rises, total cholesterol also rises. These changes may be the result of oxidative stress and may contribute to atherogenesis and pathogenesis of pre-eclampsia.[1] Recent studies suggest that leptin is involved in cardiovascular complications of obesity including arterial hypertension. It is also synthesized and secreted by placenta and may contribute to pathogenesis of Pre-eclampsia.[2] Placental implantation with abnormal trophoblastic invasion of uterine vessels is a major cause of hypertension associated with preeclampsia syndrome.[3] Maternal obesity, both in itself and as part of the insulin resistance syndrome, is an important risk factor for the development of preeclampsia. Accurately quantifying the relation between prepregnancy maternal body mass index and the risk of preeclampsia may better identify those at highest risk. Studies demonstrate a consistently strong positive association between maternal prepregnancy body mass index and the risk of preeclampsia. Increasing obesity in developed countries is likely to increase the occurrence of preeclampsia.[4]

In most obese subjects, leptin levels are high and correlate with the Body Mass Index (BMI) and the percentage of body fat. It was found that circulating leptin levels were high and positively correlated to body weight, the percentage fat and

BMI among obese Omani subjects.[5]

Pre-eclampsia is a leading cause of maternal mortality, causing an estimated more than 60,000 maternal deaths per year.[6]

Hence the study was conducted to determine a relationship of hypertension, BMI, Leptin with development of pre-eclampsia in third trimester of pregnancy.

MATERIAL AND METHODS

A total of eighty (80) women in their third trimester of pregnancy were recruited. Women with already hypertension, diabetic and renal failure were excluded from the study. History taking, clinical examination and laboratory investigations were recorded according to printed proforma. The study was completed in six months of period.

Demographic variable were height, weight, body mass index (BMI), pulse and blood pressure. Human leptin serum ELISA kits were purchased from Hangzhou east bio Pharma Company limited china. The kit utilized a double-antibody sandwich enzyme-linked immunosorbent assay (ELISA) to analyze the levels of leptin in the samples.

Shaking incubator digital control at 37°C model WIS-30 Daihan Scientific Korea, Automatic Washer Biotech Company (Auto Plate Washer),precision pipettes and disposable pipette tips, disposableeppendorf tubes for sample dilution, distilled water and absorbent paper model TC-96 (TC TECO diagnostics, USA). Twenty milliliters was used for washing solution. Serial dilution of the original standard solution prepared. A total of five dilutions (320, 160, 80, 40 and 20ng/L) of the standard samples of dilution were prepared in this way. The standard solution were putted in eppendorf tubes and separately labeled for leptin.

All samples both control and subjects were used only once (not duplicate like standard wells) in micro-ELISA strip plate well. Then we added 10μl leptin antibodies and 50μl of Streptavidin-HRP to the test wells.

After completion test, the sealed plate was then incubated at 37°C for 60 minutes in shaking incubator. The sealed ELISA plate took out from incubator after sixty minutes. The plate was kept on absorbent sheet of paper and the containing solution A and then added 50μl of chromogen solution B to each well. The plate was then gently shacked for thorough mixing. Addition of stop solution at end of reaction as final step. After adding the stop solution the ELISA plate reader was shifted to the ELISA micro plate reader machines that the blank well as zero (0) and the graph was drawn accordingly. Serum leptin levels were determined by immunoenzymometric assay.

The graphs were plotted on paper the concentrations of unknown samples were calculated by intersecting on one point of both axis and a curve achieved. The values of ET-1 were expressed in ng/L and leptin in ng/ml on the X axis of graph paper.

RESULTS

This study was conducted in the 3rd trimester of the pregnancy. A total of 80 pregnant females included. Majority of the patients were in the age range of 17-26 years of age (Table I). Weight range of the respondents was 46-105 kg. Maximum number 30(37.5%) of patients were in weight ranging 66-75 kg (Table II). Blood pressure data of the respondents was recorded. We observed maximum number of patients were normotensive systolic BP 110-130mmHg (47%). About 43% of patients had BP>140mmHg up to 200mmHg. 5% had malignant hypertension between 210-230mmHg (Table III).40% had diastolic BP >90mmHg. 6% had Diastolic BP between 130-140mmHg(Table IV). Body Mass Index data of the respondents were as follow, 23.5% had BMI>32.6. 38% had BMI between 27.62-32.62 (table V).

Serum Leptin level in 3rd trimester of pregnancy was also recorded and we observed that majority of the patients were in the leptin serum range of 229.57-329.57. 7.75% had serum leptini level

above 329 with a maximum of 829.6 in one patient at top in data (Table VI).

Age	Total	Percent
17-26	42	52.5
27-36	30	37.5
37-46	8	10
Grand Total	80	

Table-I. Age grouping of patients

Weight kg	Total	Percent
46-55	4	5
56-65	25	31.25
66-75	30	37.5
76-85	18	22.5
86-95	2	2.5
96-105	1	1.25
Grand Total	80	

Table-II. Weight categorization of clients.

SYST BP	Total	Percent
90-109	2	2.5
110-129	38	47.5
130-149	2	2.5
150-169	21	26.25
170-189	10	12.5
190-209	3	3.75
210-230	4	5
Grand Total	80	

Table-III. Systolic blood pressure data of patients.

DIST BP	Total	Percent
60-69	2	2.5
70-79	16	20
80-89	22	27.5
90-99	1	1.25
100-109	17	21.25
110-119	12	15
120-129	5	6.25
130-140	5	6.25
Grand Total	80	

Table-IV. Diastolic blood pressure data of patients.

BMI	Total	Percent
17.62-22.62	8	10
22.62-27.62	22	27.5
27.62-32.62	31	38.75
32.62-37.62	9	11.25
37.62-42.62	1	1.25
42.62-47.62	6	7.5
>47.62	3	3.7
Grand Total	80	

Table-V. Body Mass Index data of the respondents

LEP	Total	Percent
29.57-129.57	8	10
129.57-229.57	44	55
229.57-329.57	21	26.25
329.57-429.57	1	1.25
429.57-529.57	3	3.75
629.57-729.57	2	2.5
729.57-829.57	1	1.25
Grand Total	80	

Table-VI. Leptin in 3rd trimester of pregnancy

DISCUSSION

Serum leptin levels during pre-eclampsia are strongly associated with total cholesterol whereas association with other variables is insignificant. With severity of pre-eclampsia when leptin level rises. These changes may be the result of oxidative stress and may contribute to atherogenesis and pathogenesis of pre-eclampsia.[7] Leptin is an adipocyte-derived hormone that decreases food intake and body weight via its receptor in the hypothalamus. Its level increases in pre-eclampsia. Serum Leptin level in 3rd trimester of pregnancy were in the leptin serum range of 229.57-329.57. 7.75% had serum leptin level above 329 with a maximum of 829.6 in one patient at top in data. Papastefanou et al., described that if the serum leptin levels increases than normal in early pregnancy the risk for developing pre-eclampsia will be greater in third trimester of pregnancy.[8] It is suggested in some literatures that leptin not only taking part in pre-eclampsia but also have the effects on reproduction process and puberty. The possibility of pre-eclampsia in pregnancy is closely contributed by high levels

of leptin and placental hypoxia. The obesity and hypertension playing part in as in these women leptin levels remains elevated as compared to normotensive and slim women.[9] We also observed that maximum number 30(37.5%) of patients were in weight ranging 66-75 kg.

We observed that about 43% of patients had BP>140mmHg up to 200mmHg. 5% had maligmant hypertension between 210-230mmHg. Formerly called toxemia, preeclampsia is a condition that pregnant women develop. It is marked by high blood pressure and a high level of protein in the urine. Pre-eclampsia is considered to be the severe and fatal complication of pregnancy in the world. In poor, developing and even in developed countries pre-eclampsia is the main cause of mother and baby mortalities.[10] Another study reported that in pre-eclampsia leptin taking part in hypertension and placental hypoxia when plasma leptin level the serum leptin levels were recorded high as compared to non-pregnant women and the levels further increases in complicated cases of pregnancy such as pre-eclampsia.[11]

In present study we found that Body Mass Index data of the respondents were as follow, 23.5% had BMI>32.6. 38% had BMI between 27.62-32.62. A study from the oman also reported that that serum leptin levels are higher in the Omani obese group and correlate positively with body fatness and obesity.[12]

CONCLUSION

From the present study we concluded that high plasma leptin level appears to be a marker of pre-eclampsia. Maternal obesity is strongly correlated with increased risks of pregnancy complications including pre-eclampsia. High serum leptin levels are higher in patients with increase body mass index and is associated positively with body fatness and obesity.

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“A pessimist sees the difficulty in every opportunity; an optimist sees the opportunity in every difficulty.”

Sir Winston Churchill (1874-1965)

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Dr. Anwar Khan	Data collection, Analysis formulation, Paper concept	
2	Dr. Hamzullah Khan	Paper writing, Proof reading, Editing as per prof med j format