

Full length Research paper

# Maternal serum leptin levels in extreme preeclamptic pregnant ladies in early postpartum organize

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The point of this study is to decide early post-pregnancy maternal serum leptin levels in serious preeclamptic pregnant ladies. This study was arranged as a planned controlled preliminary. The patient and control bunches in the review were created in the period between January 2003 and January 2004. The review acted in the Department of Perinatology of SSK Bakirkoy Maternal Hospital and Women and Child Diseases Education Hospital, comprises 44 singleton pregnant ladies conceiving an offspring after being hospitalized with the conclusion of extreme toxemia and 44 normotensive singleton pregnant ladies who were found to have sound pregnancy on assessment and examination before conceived an offspring. The venous blood of all pregnant was taken from the antecubital area in the early post-pregnancy period while they were all ravenous. We concentrated on the connection between segment information, biochemical information, child weight upon entering the world, and serum leptin levels. Contrasting the preeclamptic pregnant ladies and control bunch as far as leptin, in spite of the fact that leptin levels in serious preeclamptic pregnant ladies were viewed as higher than control bunch, measurably, no tremendous not entirely set in stone ( $p: 0.069$ ). In extreme preeclamptic bunch, child weight upon entering the world was viewed as altogether lower ( $p: 0.000$ ). Assessing every pregnant lady, it was resolved that there has been a positive huge connection between serum leptin levels and diastolic strain ( $p: 0.044$ ), urea ( $p: 0.019$ ), creatinine ( $p: 0.000$ ), uric corrosive ( $p: 0.000$ ); and a negative critical connection between serum leptin levels and child weight upon entering the world ( $p: 0.038$ ). No connection was found between the leptin level and the orientation of newborn children. No huge contrast of early post-pregnancy maternal serum leptin levels between extreme preeclamptic bunch and normotensive still up in the air..

**Key words:** preeclamptic, early postpartum stage, serum leptin levels, severe preeclamptic pregnant women.

## INTRODUCTION

Not entirely set in stone in human and rodents, is a protein chemical combined from fat tissue, coded by stoutness (ob) quality (Zhang et al., 1994). Leptin is principally created from fat tissue, and furthermore, it is delivered in bone marrow fat cells, fundal epithelium of stomach, muscle, granulosa and cumulus cells in mature ovarian follicle, placenta, lactating mammalian epithelial cells (Lharrague et al., 1998; Cioffi et al., 1997). Leptin gives communication (transmission) between fat tissue and sensory system and assumes a part in dietary admission and energy utilization. Besides, it assumes a part in a few physio-rationale occasions, for example, conceptive framework, angiogenesis, hematopoiesis, safe framework, lipid and bone metabolism, glucose digestion heavily influenced by insulin responsiveness, ovarian capabilities,

thoughtful enactment, gastrointestinal capabilities, cerebral turn of events (Mantzoros, 1999). In pregnant ladies, leptin levels is resolved high during pregnancy, especially in second and third tri-mesters, in contrast with the ones who are not pre-gnant and it diminishes not long before conveyance (Masuzaki et al., 1997; Chien et al., 1997). As exogenous leptin is cleared from dissemination quickly, to keep up with high leptin levels saw in pregnancy, continuous excitement of leptin emission is reasonable required. Variance of leptin levels in pregnancy relates with estradiol and human chorionic gonadotropin (HCG) levels in maternal circulation. This present circumstance proposes that there is a powerful relation between fluctuating degrees of reproductive hormones discharged (swayed) in pregnancy and leptin (Hardie et al., 1997). Expanded leptin levels in pregnancy have demonstrated that leptin could be an element showing food circumstance among mother and hatchling. Leptin level is high in hatchling at term too (Jaquet et al., 1998). Leptin and receptor articulation in fetal bone recommend that leptin can be significant in bone and ligament advancement as well as hematopoiesis in intrauterine life. Hypertensive infections are the most inces-

sant unexpected problems of pregnancy, and have the occurrence running between 5 to 10%. Likewise, they are among the primary drivers of maternal and perinatal horribleness and bleakness around the world (Williams, 2001).

Relationship among toxemia and maternal serum leptin levels has not been completely seen at this point. While in certain examinations, leptin level has been found to have expanded in preeclamptic pregnant ladies (McCarthy et al., 1999). In different examinations, no distinction not set in stone in hypertensive and normotensive pregnancies (Sattar et al., 1998). However, it has additionally been shown that leptin is created by placenta and that the production is expanded in toxemia (Mise et al., 1998).

The point of this study is to think about post pregnancy beginning phase maternal serum leptin levels of typical and preeclamptic pregnant ladies.

## MATERIALS AND METHODS

This study was arranged as a controlled planned preliminary. The patient and control bunches in the review were created in the period between January 2003 and January 2004. The review comprises of 44 singleton pregnant ladies conceiving an offspring after hospitalized with determination of serious toxemia and 44 normotensive singleton pregnant ladies who were found to have solid pregnancy on assessment and investigation. The ladies conceived an offspring in the Department of Perinatology of SSK Bakirkoy Maternal Hospital and Women and Child Diseases Education Hospital. The review was begun by the choice taken from neighborhood morals panel. The patients were educated about their illnesses and the treatment and treatment approval structures and the endorsement of the relative multitude of patients were guaranteed. Extreme preeclamptic patients were picked by the severe toxemia rules of American College of Obstetricians and Gynecologists (ACOG) Committee (American College of Obstetricians, 1986). Every one of the patients were chosen among the patients hospitalized in Perinatology Department and determined to have serious toxemia in light of research facility examination. Every one of the patients remembered for the review were singleton and in third trimester. From all the hypertensive pregnant ladies, segment information and history were re-

recorded, and the blood and pee tests were gathered for complete blood count, complete pee examination, urea, creatinine, uric corrosive, aspartate aminotransferase (AST), alanine aminotransferase (ALT), lactate dehydrogenase (LDH), and protein in 24-h pee (Esbach). Every one of the cases were chosen from the non-smoker patients who had no infections and no medication utilize that could influence energy metabolism. Gestational age of all not set in stone by performing ultrasound (US) biometry and assessing USg information belonging to the main trimester. Control bunch was matched with extreme preeclamptic bunch as far as pre-pregnancy BMI, training level, duration of marriage, age,

number of conveyance, gestational age and type of conveyance. This gathering was comprised of singleton nonsmoker pregnant ladies who had no clinical issues and medication use. All the examinations performed for serious preeclamptic pregnant ladies with the exception of Esbach were acted in charge bunch. In the postpartum beginning phase, blood tests of the multitude of pregnant ladies were taken from the antecubital locale. In view of the wholesome preclusion before conveyance for the patients in the time of conveyance with ordinary unconstrained conveyance (NSD) and in light of the solicitation of 6-8-h time of fasting for the patients going through a cesarean segment in our facility, blood testing was performed when every one of the patients was eager. The blood test for the leptin test was centrifuged at +4°C; the serum got was frozen right away and put away at - 20°C until examined. Serum leptin is still up in the air by utilizing a strong stage Enzyme Amplified Sensitivity Immunoassay (EASIA) microtitre plate pack (Biosource Europe S.A., Nivelles, Belgium). Recognizable least leptin fixation was 0.1 ng/ml; the interassay variety coefficient was 5.2%, and the intraassay variety coefficient was 3.6%. Among the biochemical boundaries, urea and uric were still up in the air with UV test; creatinine was estimated with the Jaffe technique; AST, ALT, and LDH were estimated by energy strategy; 24 h urinary was not entirely set in stone with Esbach's precipitation strategy. Estimations were performed with Hitachi particular H+ISE 900 auto analyzer.

## Factual tests

For measurable examination, Statistical Package for Social Sciences (SPSS) for Windows 10.0 program was utilized. For assessing the information of the review, alongside the reciprocal factual strategies (middle, standard deviation), free understudy's t test for comparing of parametric information, chi-square tests for looking at non-parametric information, person's connection examination for deciding the association of leptin with other clinical and biochemical boundaries was utilized. The factual importance limit was acknowledged as  $p < 0.05$ .

## RESULTS

No tremendous still up in the air between extreme preeclamptic pregnant ladies and the pregnant ladies in control bunch with regards to progress in years, term of the marriage, number of conveyance, BMI, and gestational age at conveyance ( $p > 0.05$ ). Between the two gatherings, a measurably significant not entirely set in stone as far as systolic and diastolic tension and child weight upon entering the world (in spite of matching as gestational age) ( $p: 0.000$ ;  $p: 0.000$ ;  $p: 0.000$ , respectively) (Table 1).

When the serious preeclamptic pregnant ladies were contrasted and the pregnant ladies in the control bunch as far as leptin, despite the fact that leptin levels in extreme preeclamptic pregnant ladies were higher contrasted with control bunch, measurably no huge distinction was determined ( $p: 0.069$ ). At the point when the two gatherings were thought about in terms of urea ( $p: 0.000$ ), creatinine ( $p: 0.007$ ), uric acid ( $p: 0.000$ ), AST ( $p: 0.023$ ), ALT ( $p: 0.000$ ),

**Table 1.** Demographic data of severe preeclamptic and normotensive pregnant groups..

	Severe Preeclamptic Pregnant Women (n:44)	Normotensive Pregnant Women (n: 44)	P
Age (year)	27,34±5,9	28,3±6,0	NS
Duration of marriage (year)	5,88±5,3	6,5±5,5	NS
Number of delivery	0,84±0,9	0,88±0,9	NS
Systolic Pressure (mmHg)	174,3±15,7	111,8±8,9	P:0,000
Diastolic Pressure (mmHg)	115,9±10,6	71,13±6,8	P:0,000
Gestational Age at Birth (week)	34,6±3,3	34,7±2,8	NS
Weight at Birth (gr)	1938±706,7	2670±838,7	P:0,000
Body mass index	25,41±5,11	25,18±2,27	NS

NS: Not significant. All of the values are indicated as median± SD.

**Table 2.** Biochemical and leptin data of severe preeclamptic and normotensive pregnant groups.

	Severe Preeclamptic Pregnant Women (n:44)	Normotensive Pregnant Women (n:44)	P
Urea (mg/dl)	32,4±20,68	19,4±6,8	P:0,000
Creatinine (mg/dl)	0,99±1,03	0,55±0,13	P:0,007
Uric acid (mg/dl)	5,57±1,8	2,87±0,76	P:0,000
AST (U/l)	43,11±43,32	27,45±11,46	P:0,023
ALT (U/l)	43,47±42,09	11,09±4,11	P:0,000
LDH (U/l)	656,84±307,39	477,86±141,55	P:0,001
Hematocrit	32,36±4,24	30,55±3,06	P:0,025
Thrombocyte	162663±88325	201250±88325	P:0,011
Esbach (gr/24 saat)	3,39±2,3		
Leptin (ng/mL)	13,80±17,52	8,5±6,9	NSP:0,069

All of the values are indicated as median± SD.

LDH (p:0.001), hematocrit (p:0.025), thrombocyte (p:0.011), a statistically significant difference was determined (Table 2). As for neonatal morbidity, it was higher in severe preeclamptic patient group and it was statistically significant (p: 0.01) (Table 3). In terms of the form of delivery, no difference was determined (p: 1.000) between severe preeclamptic group and control group, but a significant difference was found between the two groups in comparing cesarean section indication (Table 4) (p: 0.001). When all the pregnant women included in the study were evaluated together, no statistically significant association was determined between leptin and diastolic pressure, gestational age at birth, AST, ALT, LDH, hematocrit, thrombocyte, and BMI. There were a negative weak association between leptin levels and baby weight at birth (p: 0.038); a positive weak association between leptin levels and diastolic pressure (p:0.044); a positive weak association between leptin levels and urea (p:0.019); a positive moderate association between leptin levels and creatinine (p:0.000); a positive weak association between leptin levels and uric acid (p:0.000); a positive moderate association between leptin levels and Esbach.

### Comment

High leptin levels in women may play a role to determine

the presence of sufficient and long term energy reserves required for a successful reproduction (Chebab, 1997). In pregnant women, throughout pregnancy, especially in the second and third trimester, leptin levels are found higher than those of the women not pregnant, and just before the delivery leptin levels are decreased (Masuzaki et al., 1997; Chien et al., 1997). Hyperleptinemia in second and third trimester can be compared with that in obese animal and human. While exogenous leptin can be cleared from circulation rapidly, to maintain elevated leptin levels in pregnancy, probably leptin secretion should be stimulated continuously. Fluctuations in leptin levels in pregnancy show a correlation with estradiol and HCG levels in maternal circulation (McCarthy et al., 1999). This situation suggests that there is a dynamic relation between fluctuating levels of reproductive hormones secreted in pregnancy and leptin.

In a study of Misse et al. (1998), leptin level, for the first time, was found to be significantly high in preeclamptic pregnant women, especially in cases with severe preeclampsia (Mise et al., 1998). In these patients, it has been shown that placental leptin mRNA expression was increased proportionally with serum leptin levels and that serum leptin level was decreased following expelling of placenta after delivery. That indicates that leptin increase in preeclamptic woman is related to placental production. Increase of placental leptin production reflects placental

**Table 3.** Comparison of delivery form and section indication of severe preeclamptic and normotensive pregnant groups.

		Severe Preeclamptic Pregnant Women (n: 44)	Normotensive Pregnant Women (n:44)	Total
NSD		11	11	22
Section indications	Fetal distress	20	3	23
	Prolapsed umbilical cord		1	1
	Abnormal presentation		1	1
	Section history	5	13	18
	Breech presentation	2	6	8
	Abruptio placentae	4		4
	Unpregressive labor	2	3	5
	Primigravid age		1	1
	Placenta previa		1	1
	Early membrane rupture		3	3
	Assisted pregnancy		1	1

Pearson chi-square p:0.001 (section indications).

**Table 4.** Comparison of neonatal morbidity of severe preeclamptic and normotensive pregnant groups.

		Severe Preeclamptic Pregnant Women (n: 44)	Normotensive Pregnant Women (n:44)	Total
Neonatal morbidity	Stillbirth or death within 12 h	3	0	3
	Morbidity present	24	14	38
	Morbidity absent	17	30	47
Total		44	44	88

Pearson chi-square p:0.001

hypo perfusion and/or hypoxia. Hypoxia increases placental leptin production inducing a group of placental genes in trophoblastic cells. Thus, it is deduced that elevated leptin level is a general response of trophoblastic cells to hypoxia. Leptin is an indication of severe preeclampsia, reflecting placental hypoxia (Chebab, 1997). The importance of increased placental leptin production is not known. It is known that leptin increases production and degradation of noradrenalin in brain fat tissue (Takaya et al., 1996). And it shows that leptin can augment sympathetic activity. Moreover, considering increased sympathetic activity in preeclamptic pregnant women, it can be thought that leptin can contribute to increased sympathetic activity in preeclampsia. That intra-cerebroventricular leptin infusion increases arterial pressure has made us to think that in preeclampsia, leptin may play a role in development of hypertension (Dunbar et al., 1997). Some other studies have not observed any difference in terms of leptin between normal and preeclamptic pregnant women (Sattar et al., 1998; Martinez-Abundis et al., 2000). In another study, while leptin levels were determined high in normal weight preeclamptic pregnant women at second trimester, leptin levels were determined low in overweight preeclamptic pregnant women (Williams et al., 1999). It can be thought that in preeclamptic pregnant women, maternal serum leptin levels can be varied due to the severity of disease. But Martinez-Abundis et al. (2000) has determined similar serum leptin levels in insignificant preeclamptic, severe preeclamptic and normo-

tensive pregnant women [(Martinez-Abundis et al., 2000). Despite the leptin levels in the blood samples of pregnant women in control group, and the fact that severe preeclamptic pregnant women were determined higher in severe preeclamptic pregnant women in our study, no statistically significant difference was determined (p: 0.069). That can make one to think that although leptin level is high in severe preeclamptic pregnant women, postpartum sudden decrease of leptin level (Hardie et al., 1997; Lage et al., 1999) results in not detecting a statistically significant difference.

Many studies, investigating the relation of baby weight at birth with maternal serum leptin and umbilical blood leptin levels, have been performed. In these studies, while a correlation has been determined between umbilical blood leptin level and baby weight at birth (Hassink et al., 1997; Tamura et al., 1998; Schubring et al., 1997), no correlation has been determined between maternal serum leptin levels and baby weight at birth (Tamura et al., 1998; Schubring et al., 1997; Butte et al., 1997; Tamas et al., 1998; Kolusari et al., 2008; Kolusari et al., 2009). In our study, we determined a weak correlation between maternal serum leptin levels at early postpartum period and baby weight at birth. This result, contrary to the literature, can be originated from prepartum or postpartum blood sampling.

In our study, when maternal serum leptin level was compared to the other parameters tested, a positive correlation was determined with leptin level and diastolic pressure, urea, creatinine, uric acid, Esbach. No relation

was found between liver function tests (AST, ALT, LDH) and leptin levels. Decreased renal clearance due to impaired renal function, one of the pathophysiologic findings in preeclamptic pregnant women, can cause this result. It should be considered that, not an increased production of leptin, but decreased renal clearance can be the cause of increased serum leptin level determined in preeclamptic pregnant women in most of the studies. Decreased plasma volume that can be a subject in preeclampsia may have a responsibility for increased leptin level leading to hemoconcentration. But in our study, although a significant difference was determined between hematocrit values of two groups, no difference was determined between leptin levels.

As a conclusion, no significant difference was determined between severe preeclamptic pregnant women and normotensive pregnant women in terms of early postpartum maternal serum leptin levels. A positive significant correlation was determined between leptin levels and diastolic pressure, urea, creatinine, uric acid and Esbach. A negative significant correlation between leptin levels and baby weight at birth was determined. There is a correlation between leptin and several physiologic functions and situations. But the role of leptin in pregnancy has not been explained yet. It is getting even more and more difficult because of the differences between animal models and human in leptin physiology. But the studies to explain the exact role of leptin in fertility, pregnancy and lactation have been performed continually. The recent studies have shown that leptin can be very important in mammalian reproductive and gestational tissues, especially placenta which can be the main source of leptin production in pregnancy. Varying leptin levels in normal pregnancy and in gestational trophoblastic diseases have been shown that leptin can play a physiologic or pathophysiologic role in human pregnancy. Further studies are required to understand its importance, and it is essential to perform more and more studies to verify and clarify the relationship between leptin and parameters of biochemistry in preeclampsia.

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