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Research Article

## ANALYSIS OF RELATIONSHIP OF OBESITY AND HYPERTENSION AMONG PREGNANT WOMEN IN PAKISTAN

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**Abstract:**

**Introduction:** Obesity is considered a risk factor for preeclampsia and there are many common mechanisms that link obesity with a higher risk of developing preeclampsia.

**Objectives of the study:** The basic aim of the study is to analyze the relationship of obesity and hypertension among pregnant women in Pakistan.

**Methodology of the study:** This cross sectional study was conducted in Sir Ganga ram hospital, Lahore during June 2018 to January 2019. The data was collected from 200 pregnant female patients who visited the OPD of the hospital regularly. The inclusion criteria for the participants included: (1) age up to 50 years, (2) ability to answer the questionnaire, and (3) living in the selected communities for more than 6 months in the past year. In this study we selected patients who was suffering from obesity and hypertension. For this purpose we select the patients from both genders. We design an analysis survey for the collection of data.

**Results:** The data was collected from 200 female patients. The mean and median ages of the study participants were 35 and 32 years old respectively. Regarding the self or family history of any chronic disease; 50 (50%), and 16 (3.3%) of the total study participants were known hypertensive, and diabetes mellitus (DM) patients respectively, while 82 (16.8%) and 64 (13.1%) have family history of hypertension and DM respectively.

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**INTRODUCTION:**

Obesity is considered a risk factor for preeclampsia and there are many common mechanisms that link obesity with a higher risk of developing preeclampsia. It is well known that obesity is one of the most important public health problems worldwide. It is a major independent risk factor for chronic diseases such as cardiovascular disease (CVD) and diabetes mellitus; obesity is also associated with high morbidity and mortality [1]. Over the past 20 years, the prevalence of obesity has increased greatly worldwide and in China, in particular. A relationship between obesity, including both general obesity and central obesity, and hypertension has been suggested in many studies [2]. Two of the most commonly used anthropological indices in clinical practice and population surveys are the body mass index (BMI) and the waist circumference (WC), indicating general obesity and central obesity, respectively. Hypertension has been recognized as a global health concern for developing countries and is scarcely described in many of these countries [3]. In Pakistan, few population-based surveys evaluated the prevalence of hypertension and there is no current nationally representative study. Elevated BP is positively correlated to the risk of stroke and coronary heart disease. Other than coronary heart disease and stroke, its complications include heart failure, peripheral vascular disease, renal impairment, retinal hemorrhage, and visual impairment [4]. Hypertensive disorders are amongst the most common disorders that affect pregnant women and are major contributors to maternal deaths. In a systematic review conducted by the World Health Organization (WHO), 16% of maternal deaths in developed countries were attributed to hypertensive disorders, 9% in the regions of Africa and Asia, and as high as 25% in Latin America and the Caribbean. WHO-review named hypertensive disorders during pregnancy the leading cause of maternal deaths in industrialized countries, responsible for 16% of maternal deaths [5].

Hypertension (or HTN) or high blood pressure is defined as abnormally high arterial blood pressure. According to the Joint National Committee 7 (JNC7), normal blood pressure is a systolic BP < 120 mmHg and diastolic BP < 80 mmHg<sup>2</sup>. Hypertension is defined as systolic BP level of  $\geq 140$  mmHg and/or diastolic BP level  $\geq 90$  mmHg. The grey area falling between 120–139 mmHg systolic BP and 80–89 mmHg diastolic BP is defined as

“prehypertension”. Although prehypertension is not a medical condition in itself, pre-hypertensive subjects are at more risk of developing HTN [6].

**OBJECTIVES OF THE STUDY:**

The basic aim of the study is to analyze the relationship of obesity and hypertension among pregnant women in Pakistan.

**METHODOLOGY OF THE STUDY:**

This cross-sectional study was conducted in Sir Ganga ram hospital, Lahore during June 2018 to January 2019. The data was collected from 200 pregnant female patients who visited the OPD of the hospital regularly. The inclusion criteria for the participants included: (1) age up to 50 years, (2) ability to answer the questionnaire, and (3) living in the selected communities for more than 6 months in the past year. In this study we selected patients who was suffering from obesity and hypertension. For this purpose, we select the patients from both genders. We design an analysis survey for the collection of data.

All participants were given a standardized medical examination in which their systolic blood pressure (SBP) and diastolic blood pressure (DBP) were measured. Blood pressure (BP) was measured in the right arm by trained examiners using a mercury sphygmomanometer according to a standard protocol.

**STATISTICAL ANALYSIS:**

Descriptive statistics were generated for all variables, according to gender. Numerical data were expressed as the mean and standard deviation (mean  $\pm$  S.D), and categorical data were expressed as percentages.

**RESULTS:**

The data was collected from 200 female patients. The mean and median ages of the study participants were 35 and 32 years old respectively. Regarding the self or family history of any chronic disease; 50 (50%), and 16 (3.3%) of the total study participants were known hypertensive, and diabetes mellitus (DM) patients respectively, while 82 (16.8%) and 64 (13.1%) have family history of hypertension and DM respectively. For females, a significant difference in the prevalence of general obesity was found only between the age 50–59 group and the age 70–79 group ( $P=0.001$ ); however, significant differences in the prevalence of central obesity and hypertension were found.

**Table 01:** Statistical analysis values of Control group and diseased group

	Offspring without overweight/obesity	Offspring with overweight/obesity
Maternal age (years)		
≤25	90.7	9.3
26-30	90.5	9.5
31-35	92.3	7.7
≥36	92.0	8.0
Maternal BMI (kg/m <sup>2</sup> )		
<18.5	94.7	5.3
18.5-24.9	90.5	9.5
25-29.9	81.4	18.6
≥30	80.1	19.9
Maternal education		
<High school	91.5	8.5
High school	88.7	11.3
>High school	88.9	11.1
Maternal occupation		
Farm work/housework	91.6	8.4
Routine job	89.7	10.3
Others	88.1	11.9
Maternal parity		
Primiparous	90.4	9.6
Multiparous	93.1	6.9
Caesarean - section		
No	92.8	7.2
Yes	90.1	9.2
Offspring sex		

Boy	89.9	10.1
Girl	91.9	8.1
High BP at 1st trimester		
No	90.9	9.1
Yes	87.4	12.6
High BP at 2nd trimester		
No	90.9	9.1
Yes	83.2	16.8
High BP at 3rd trimester		
No	91.1	8.9
Yes	89.0	11.0
Gestational weeks, wk	39.3 (1.12)	39.2(1.10)
DBP at 1st trimester, mmHg	68.4 (7.2)	68.9 (7.4)
SBP at 1st trimester, mmHg	105.8 (10)	106.6 (10.3)
DBP at 2nd trimester, mmHg	69.0 (7.1)	69.6 (7.4)
SBP at 2nd trimester, mmHg	108.6 (10)	109.9 (10.4)
DBP at 3rd trimester, mmHg	75.2 (8.6)	76.0 (9.0)
SBP at 3rd trimester, mmHg	115.1 (11.4)	116.5 (11.6)
Infant birth weight, g	3328.9 (400.6)	3443 (423.8)

### DISCUSSION:

There is accumulating evidence that high maternal BP or hypertensive disorders of pregnancy are associated with offspring BP. Epidemiologic studies unequivocally support the positive association between body weight and BP, and between obesity and hypertension. It was hypothesized that adiposity is in the causal pathway of maternal gestational hypertensive disorders with offspring high BP. This speculation needs confirmation in future studies [7].

The potential effects of pregnancy hypertensive disorders and normal range BP during pregnancy on higher offspring obesity risk may involve quite different mechanisms. Hypertensive disorders of

pregnancy are well-known causes of intrauterine growth restriction, and DBP levels higher than 90 mmHg, a threshold commonly used to define hypertensive disorders, are inversely associated with birth weight [8]. Higher third trimester umbilical artery vascular resistance, a parameter reflecting the placental dysfunction, has been associated with slower foetal growth and a smaller size at birth, but higher childhood BMI.

The prevalence of obesity has increased worldwide and has nearly doubled between 1980 and 2008. A large number of studies have shown that the risk of obesity increases in those with hypertension, and the relationship between obesity and hypertension differs

according to age, gender, geographical area and race [6]. Discussions around the global epidemic of obesity have often used the future tense for the developing world. We have shown that current rates of overweight and obesity are already unacceptably high among youths. This is of considerable concern for a number of reasons [7]. Obesity tends to track within individuals and populations: obese children become obese adults. This tendency, combined with the continued trend toward urbanization, will serve to seriously escalate adult levels of obesity: we observed a 2.5 times greater prevalence of obesity among urban residents than among rural residents [9]. In addition, there are indications that obesity in youth coupled with low birth weight is the worst possible combination for adult cardiovascular disease and diabetes, conditions to which Indo-Asian populations are already particularly susceptible [10].

### CONCLUSION:

It is concluded that there is an alarming situation of obesity among pregnant local population of Pakistan which leads to many health issues like hypertension and CVD. Among normotensive women, greater gestational rises in DBP and SBP were associated with higher offspring childhood overweight/obesity risk.

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