**ORIGINAL ARTICLE**

# Physiological and Biochemical changes by Pregnancy induced Hypertension in Diabetic and Non-Diabetic women

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## ABSTRACT

This is a comparative study in which the aims and objectives were to test the correlation of pregnancy induced hypertensionwith glucose and lipid profile of pregnant women. Present study has significant (<0.005)results. Glucose, cholesterol, triglyceride, LDL and HDL levels of Group B and Group C, have prominent changes (179±11.10, 248±22.10, 310±10.00, 190±12.1, 32±20.00), (130±20.00, 208.14±21, 160±10.00, 170±1.00, 33±3.00) as compared to the Group A i.e. control group (125±21.00, 178.10±24.10, 140±30.00, 130±11.10, 41±2.00) respectively.

**Key words:** Pregnancy induced hypertension, Hyperglycaemia, gluconeogenesis, glycogen

## INTRODUCTION

Force exerted by the flow of blood on blood vessels is known as blood pressure. Blood travels throughout the body in arteries by the pumping of heart. When the blood pressure will be higher than the normal ranges the condition said to be hypertension[11]. In pregnant women some time blood pressure raised due to pregnancy and these cases are considered as pregnancy induced hypertension[3]. Different researchers stated in their studies that pregnancy induced hypertension may cause placental abruption, seizures in the mother, kidney problems, liver complications and blood clotting syndrome etc. [12].In pregnant women raised blood pressure, protein in the urine and swelling on face, feet and hands are the indications of pregnancy induced hypertension. Sometime women face the problems of abdominal pain, headache, blood in urine and vomiting[5,11].

Carbohydrate metabolic disorder is referred as diabetes mellitus[2]. Hyperglycaemic conditions are very dangerous for biological system[4]. Kidneys and eyes are mostly affected by diabeties. In diabetic patients lipoproteins abnormalities are developed because of both hyperglycaemia and hypoglycaemia[6,7]. Type 2 diabeties is produced mostly after 30 years and in these cases less insulin biosynthesis by beta cells of pancreas or in some cases not response to the receptors. In different studies it has concluded that hyperlipidemia is very common in hypertensive community[8]. A research explained the higher levels of cholesterol, triglyceride, and low density lipoprotein in hypertensive individuals as compared to the non-hypertensive individuals[10]. In the body glucose homeostasis mainly maintained by liver.Excess amount of the glucose in the body store in the form of glycogen which convert again into glucose[9]. Some amount of glucose also produced by the process of gluconeogenesis from non-carbohydrate sources gluconeogenesis[1],

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## MATERIALS AND METHODS

The current study is conducted in Gynaecological wards of Jinnah hospital Lahore. In this study 250 pregnant (in first trimester) women were selected and divided them into two different groups. 50 women were in group A, 100 women were in Group B and 100 were in Group C. In Group A all the women were pregnant without any problem. In Group B 100 pregnant women were diabetic with hypertension. While in Group C 100 women were non- diabetic with hypertension. Glucose and lipid profile were measured by spectrophotometer with kits method. Blood pressure was taken by sphygmomanometer. The raw data interoperated by applying SPSS.

## RESULTS

Group A…. Control n= 50

| Measured parameters | Measuring units | Mean ± SD |
|---|---|---|
| Systolic B.P | mm/Hg | 120.01±12.90 |
| Diastolic B.P | mm/Hg | 81.11±10.00 |
| Glucose levels (random ) | mg/dl | 125±21.00 |
| Cholesterol | mg/dl | 178.10±24.10 |
| Triglyceride | mg/dl | 140±30.00 |
| LDL | mg/dl | 130±11.10 |
| HDL | mg/dl | 41±2.00 |

<0.005

Group B: Diabetic pregnant women with pregnancy induced hypertensive (n= 100)

| Measured parameters | Measuring units | Mean ± SD |
|---|---|---|
| Systolic B.P | mm/Hg | 150.01±10.00 |
| Diastolic B.P | mm/Hg | 90.11±10.00 |
| Glucose levels (random ) | mg/dl | 179±11.10 |
| Cholesterol | mg/dl | 248±22.10 |
| Triglyceride | mg/dl | 310±10.00 |
| LDL | mg/dl | 190±12.1 |
| HDL | mg/dl | 32±20.00 |

<0.005

The results of this study were significant (<0.005)and showed a remarkable changes in glucose, cholesterol, triglyceride, LDL and HDL levels of Group B and Group C (179±11.10,248±22.10,310±10.00,190±12.1,32±20.00), (130±20.00,208.14±21,160±10.00,170±1.00,33±3.00) as compared to the Group A i.e. control group (125±21.00, 178.10±24.10, 140±30.00,130±11.10, 41±2.00) respectively. This is a comparative study in which

hypertensive complications were seen in the form of hyperlipidemia. The individuals of Group B showed high lipid levels as compared to the individuals of other groups.

Group C:Non- Diabetic pregnant women with pregnancy induced hypertensive (n= 100)

| **Measured parameters** | **Measuring units** | Mean ± SD |
|---|---|---|
| Systolic B.P | mm/Hg | 147.10±1.80 |
| Diastolic B.P | mm/Hg | 91.21±0.00 |
| Glucose levels (random ) | mg/dl | 130±20.00 |
| Cholesterol | mg/dl | 208.14±21 |
| Triglyceride | mg/dl | 160±10.00 |
| LDL | mg/dl | 170±1.00 |
| HDL | mg/dl | 33±3.00 |

<0.005

## DISCUSSION

Ellen *et al* (2003) elaborated in their study that about 5-10% pregnancies are affected by Pregnancy-induced hypertension and has association with number of medical complications in the body. In another study Solomon*et al* (2001) claimed that Pregnancy-induced hypertension is a serious life threatening situation in which biological system may develop number of complications. Other studies explained the changes of lipids profile in pregnant women because of hypertension, produced only for short time during pregnancy. Diabetic complications are also create different complications in lipoprotein functioning. Current study was same as the previous researchers stated. There is a crystal clear changes were observed in Group B as compared to the control.

## REFERENCES


1. Al-HarbiAM. Frequency of Risk Factors for Coronary Heart Disease Among Diabetic Patients in Al-Rabwah PHC Center in Riyadh. Journal of Family & Community Medicine, 2004; 11(2):53-58.
2. American Diabetes Association (ADA). Standards of Medical Care for Patients With Diabetes Mellitus. Diabetes Care, 2003; 26(Suppl 1): s33-s50
3. Bambauer R, Bambauer C, Lehmann B, Latza R, Schiel R. Schiel R. LDL-Apheresis: Technical and Clinical Aspects. Scientific World Journal, 2012; 2012: 314283.
4. Chaturvedi N. Ethnic Differences in Cardiovascular Disease. Heart, 2003; 89(6): 681-686.
5. D'Agostino RB, Russell MW, Huse DM, Ellison RC, Silbershatz H, Wilson PW, Hartz SC. Primary and subsequent coronary risk appraisal: New results from the Framingham study. Am Heart J, 2000:139 (2 Pt 1):272-281.
6. Eastern Stroke and Coronary Heart Disease Collaborative Research Group (ESCHDCRG). Blood pressure, cholesterol and stroke in Asia. Lancet, 1998; 352 (9143):1801-1807.
7. Ganesh M, Palaneeswari SM, Karthikeyan T. Bio-Markers Assay in Acute Myocardial Infarction- A Cross Sectional Study. Int J Pharm Bio, Sci 2013; 4(4): 1139-1142.
8. Syndrome in Malaysia: An Analysis by Risk Factors. MetabSyndrRelatDisord, 2011; 9(6): 441–451.
9. Tanna N, Srivastava R, Tanna V, Vaishnani H. The Role of Unknown Risk Factors in Myocardial Infarction. IJBAR, 2013; 4 (6): 430-434.
10. Weitz D, Weintraub H, Fisher E, Schwartzbard AZ. Fish Oil for the Treatment of Cardiovascular Disease. Fish Oil for the Treatment of Cardiovascular Disease. Cardiol Rev, 2010; 18(5): 258-263.
11. Solomon CG, Seely EW. Brief review: hypertension in pregnancy: a manifestation of the insulin resistance syndrome? *Hypertension*2001: 37; 232–9.
12. Ellen W. Seely,Caren G. Solomon (2003).Insulin Resistance and Its Potential Role in Pregnancy-Induced Hypertension.*The Journal of Clinical Endocrinology & Metabolism*, Volume 88, Issue 6; Pages 2393–2398.