The Professional Medical Journal
www.theprofesional.com

ORIGINAL PROF-2339

PREGNANCY OUTCOMES;

A COMPARATIVE STUDY OF HYPERTENSIVE AND NORMOTENSIVE PAKISTANI POPULATION

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ABSTRACT… Introduction: Pregnancy is a normal physiological event but some pregnancy specific or other medical conditions can cause maternal as well as fetal morbidities and even mortalities. Among them, raised blood pressure during pregnancy adversely affects both maternal and fetal outcomes. **Objectives:** In this study, risk factors associated with hypertensive disorders of pregnancy are explored and pregnancy outcomes of hypertensive women with normotensive pregnant women are compared. **Design:** Case control study. **Settings:** Obstetrics and gynecology department of Jinnah hospital Lahore. **Period:** 1st October 2011 to 24 February 2012. **Subjects and methods:** The case control study of 250 cases (pregnant females with hypertensive disorders) and controls (pregnant females without hypertensive disorder), presented at obstetrics & gynecology department of Jinnah hospital during 1st October 2011 to 24 February 2012 was conducted. SPSS software (16) and MS excel were used for statistical analysis. **Results:** Mean age for cases and controls was 26.96 ± 5.29yearsand 25.25 ± 4.60years, respectively. Age and history of pregnancy was found to be significantly associated with hypertensive disorders of pregnancy. Comparison of neonatal outcome between case group and control group showed that hypertensive pregnant women were at higher risk of having adverse pregnancy outcome. **Conclusions:** Women with hypertension during pregnancy are at increased risk of having adverse pregnancy outcome as compared to normotensive women and age, history of pregnancy induced hypertension are contributing risk factors for developing hypertension during pregnancy.

Key words: Pregnancy induced hypertension (PIH), Pre-eclampsia, eclampsia, hypertension.

Article received on:
31/08/2013
Accepted for Publication:
03/02/2014
Received after proof reading:
21/04/2014

Article Citation: Naeem Ma, Naeem U, Hanif A. Pregnancy outcomes; a comparative study of hypertensive and normotensive Pakistani population. Professional Med J 2014;21(2): 347-353.

INTRODUCTION

Pregnancy is a normal physiological event but in some circumstances pregnancy specific or other medical conditions can cause maternal as well as fetal morbidities and even mortalities. Among pregnancy specific disorders, hypertensive disorders of pregnancy are one of the major leading causes of maternal and fetal morbidities[1]. The hypertensive disorders during pregnancies occur in almost 10-16% of pregnant women worldwide[2]. Hypertensive disorders of pregnancy have been classified in different ways by various authors[3]. Remuzzi et al., (1991) has categorized hypertension(HTN) in pregnancy into four categories: (a) pregnancy induced HTN (PIH),(b) Preeclampsia (PE) (c)eclampsia, (d) chronic HTN of any cause[3]. For the current report, we have used this classification as our judgment criteria. Pregnancy induced hypertension (PIH)is defined as hypertension appearing first time after 20 week of gestation with systolic BP ≥ 140mmHg and/or diastolic blood pressure 90 mmHg[1]. Again, there is a lack of consistency in research papers over the definition of preeclampsia[4]. Systemic hypertension (HTN)with proteinuria (> 0,3 g/24 h) that arises beyond 20th week of gestational amenorrhea and resolve by the 6th week postpartum is (PE)[5]. These disorders represent the most common medical complication of pregnancy, affecting 6 to 8% of gestations in

United States only[2].

World health organization(WHO) estimates the incidence of preeclampsia to be seven times higher in developing countries (2.8% of live births) than in developed countries (0.4%). Many factors have been reported to increase the risk of the disease. These include maternal age, previous history of PIH, parity, multiple pregnancy, insulin dependent diabetes mellitus (IDDM), chronic hypertension, renal disease, autoimmune disease, certain pre existing medical conditions[6].

Hypertension during pregnancy contributes considerably to pregnancy outcomes including preterm birth, intrauterine death (IUD), intrauterine growth restriction (IUGR), maternal morbidity, and even mortality. Furthermore, mode of delivery can be influenced by the occurrence and severity of the disease[1].

Until now, it has been widely recognized that preeclampsia-eclampsia is a multi-system syndrome and ultimately effects many others organs. The systems that could be effected includes impaired kidney function (proteinuria), HELLP syndrome(liver and effected coagulation cascade),unconsciousness, blurring of vision, coma, fit and poor perinatal outcomes(proves placental)damage[8]. The hypertensive disorders of pregnancy were also known as toxemia of pregnancy.

Although the mechanism of PE and eclampsia have not been clearly understood but it has been realized that early recognition of the disease, regular antenatal care and blood pressure (BP)monitoring in women at high risk of developing PE improves fetal and maternal outcomes[9]. Various means of preventing preeclampsia syndrome includes pharmacologic agents, dietary supplementation, and lifestyle modifications. For prevention of preeclampsia low dose aspirin therapy and calcium intake are reported to be very effective[10]. Reorientation of care givers and community leaders to enhance awareness and early recognition of the severe symptoms and risk factors may help with prompt and adequate management of the disease[11].

In low and middle-income countries, many public hospitals have limited access to neonatal intensive care, leading to higher rates of mortality and morbidity is likely to be considerably higher than in settings where such facilities are available[12]. In Pakistan, major challenges are detection, prevention, and management of PE. The delay in decision to seek care, at reaching the health facility, service provision at macro- and micro health system levels also confronts the problems. Furthermore, policy guidelines and their implementation with respect to health care facilities are also inappropriate[13].

MATERIALS AND METHODS

Study Design
Case control study design was used.

Settings
The data was collected from Jinnah Hospital, Lahore and the study was conducted at Gulab Devi, PGMI.

Sample Size
A total of 250 subjects were taken in which data from 125 cases and 125 controls was collected.

Duration of study
The study was completed in 5 months from October 2011 to February 2012.

Sampling Technique
Non probability purposive sampling technique was used.

Sample Selection Criteria
The data were taken from 250 pregnant females at Jinnah hospital. Questionnaire was made to explore the risk factors of hypertension during pregnancy and fetal and maternal outcome of pregnancy were noted. According to medical ethics, consent was taken before asking any question from the patients.

Inclusion Criteria

All diagnosed patients of any hypertensive disorder of pregnancy were included. Patients were classified as of: Chronic HTN – If patient had history off chronic HTN before 20 weeks of gestations, PIH- hypertension after 20th week of gestation, Pre eclampsia (PE)having PIH and proteinuria, eclampsia- with PIH, proteinuria and fits.

Exclusion criteria

All patients other than hypertensive disorder of pregnancy mentioned above were excluded. Data was not collected by patients who presented to OPD and was discharged after sometime or came for regular antenatal checkup.

A total of 125 cases were compared with 125 controls (patients not having any hypertensive disorder of pregnancy).The data was analyzed using SPSS (version 16)software. The Quantitative data were presented in form of mean and standard deviation while Mann – Whitteny U test was applied to analyze the significant results. The qualitative data were analyzed by Chi Square test and odd ratio. P-value equal to or less than 0.05 was taken as significant.

RESULTS

The mean and standard deviation of age were 26.9± 5.2 years and 25.2±4.60 years in cases and control group respectively (Figure1&2). Mann Whitney U test was applied on age and it showed that there was significant (p value=0.018) effect of age on hypertensive disorders of pregnancy (Figure 1).

Among case group, there were 5 Cases (4%) of diabetes mellitus and 120 were non- diabetic. While in control group 6 cases had DM so the difference is not noteworthy, p value and odds ratio shows that DM and hypertensive disorders of pregnancy are not associated with each other. Case group had 6.4% HCV positive patients. In control group 3.1% HCV positive individuals were observed. HCV is insignificantly contributing towards hypertension in pregnancy. Case group had 4.0% women with twin pregnancy and control group had 2 women with twin pregnancy. Twin pregnancy was insignificantly contributing towards hypertensive disorders of pregnancy (Table I).

A total of 125 patients were classified as cases of different hypertensive disorders of pregnancy. Among all cases 27.2% of patients had spontaneous vaginal delivery with normal baby. The women operated by C-section were 22.4% while 6.4% of patients had intrauterine death of fetus/baby. Twelve women had preterm birth i.e. delivered before 37 week of gestation. There were patients who were diagnosed with any one of hypertensive disorders and were admitted at hospital for expectant management and their delivery was not carried out until the completion time period of this study. These patients represent highest percentage i.e. 29.6% in our study and were labeled in pie chart as 'cases not delivered yet'.. All these patients had normal fetal signs otherwise. Out of 125 patients only one patient had intrauterine growth retardation (IUGR).The pregnancy of three patients was terminated because of uncontrolled hypertension. Antepartum hemorrhage was observed in one

	Cases	Controls	Odds ratio	P-value
Diabetes Mellitus	5	6	0.729	0.7
Hepatitis C positive	8	4	2.06	0.23
Twin pregnancy	4	2	2.56	0.25
History of PIH	40	-	2.471	-
History of surgery	26	17	1.6	0.1

Table-I. Risk factors of hypertensive disorders of pregnancy.

patient. Postpartum hemorrhage (PPH) was not observed except in one patient (Figure 3).In controls, 70.40% of women had normal baby by spontaneous vaginal delivery. After SVD, C-section turned out to be of maximum frequency among controls (Figure 4).

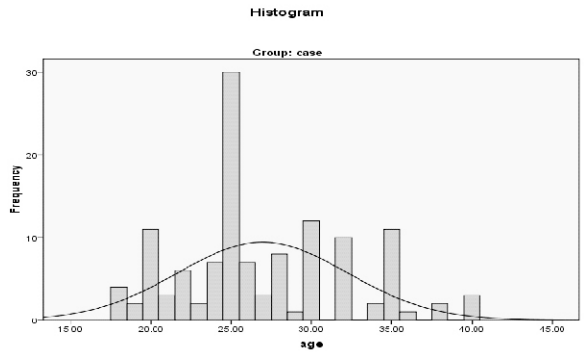

Figure-1. Frequency distribution of age among cases

In this study it was observed that age has significant effect on hypertensive disorders of pregnancy. HCV, twin, and C-section were noticed to be insignificantly contributing towards hypertensive disorders of pregnancy while women having history of raised blood pressure in any of their previous pregnancies were at greater risk of developing different hypertensive disorder of pregnancy.

SVD: spontaneous vaginal delivery.
IUD: intrauterine death.
IUGR: intrauterine growth restriction.
TOP: termination of pregnancy.
APH & PPH : antepartum and post-partum hemorrhage.

DISCUSSION

In many low income countries like Pakistan, complications of pregnancy and childbirth are the leading cause of death amongst women of reproductive years[12]. Many public hospitals have limited access to neonatal intensive care, and so the mortality and morbidity is likely to be considerably higher in such settings than the places where such facilities are available[12].

Figure-2. Frequency distribution of age among controls

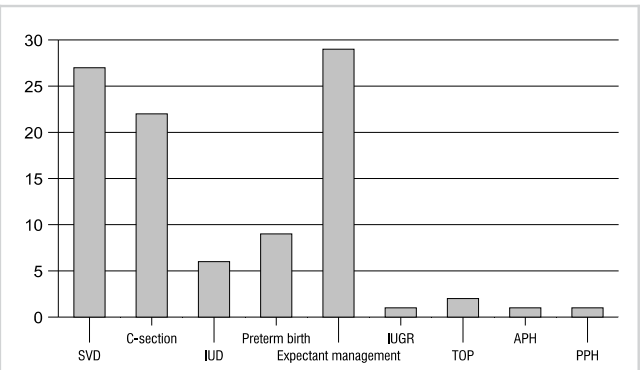

Figure-3. Pregnancy outcome among case group.

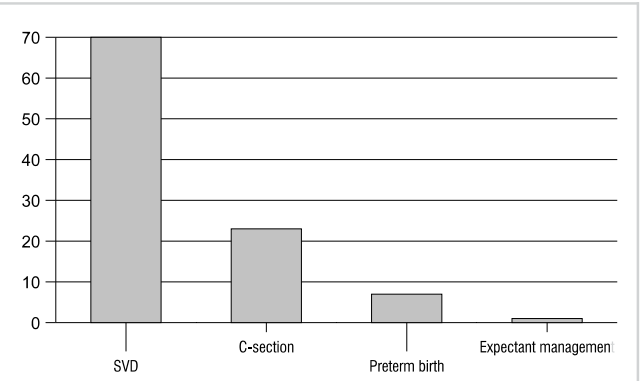

Figure-4. Pregnancy outcome among control group.

Mother's age, parity, history of PE and family history of disease are among highly known risk factors of developing hypertension during pregnancy. It has been reported previously that hypertension during pregnancy is more common among primiparous women than in multiparous[7]. In this study it is also seen that maximum number

of cases of any hypertensive disorder was of nulliparous women. Morikawa M, et al (2012) reported that maternal age, nulliparity, and pregnancy-induced hypertension (PIH) were all independent risk factors for eclampsia for Japanese women (data 2005 and 2009). However, nulliparous women were reported at greater risk of having PIH.

There are different theories about association of DM as a risk factor of hypertensive disorders of pregnancy. Bodzek et al showed that diabetes mellitus predisposes to complications of pregnancy and risk of developing PIH increases with diabetic mother[14]. In this study DM was not found to be associated with hypertensive disorders of pregnancy may be due to limited number of patients with diabetes among case group available and the no of diabetic patients among case group and control group was almost same.

This study shows that women who had history of having pregnancy induced hypertension in any of pregnancy are at greater risk of developing hypertensive disorders of pregnancy in subsequent pregnancies. Similarly Kirsten Duckitt et al carry out systematic review of controlled studies published 1966-2002and stated that women who had pre-eclampsia in a first pregnancy have seven times the risk of pre-eclampsia in a second pregnancyand women with pre-eclampsia in their second pregnancy are likely to have a history of pre-eclampsia in their first pregnancy than women in their second pregnancy who do not develop pre-eclampsia[15].

Many of the authors state that with multiple gestation or twin pregnancy there is higher risk of PIH and other forms of hypertensive disorders of pregnancy as compared to singleton pregnancies. For example, Coonrod DV et al, while studying Risk factors for preeclampsia in twin pregnancies at Washington, concluded that twin pregnancy carries nearly a fourfold increased risk of preeclampsia[16]. Similarly Buhling KJ, et al states that Twin pregnancy is associated with a higher risk of hypertension than singleton pregnancy but not for gestational diabetes mellitus[17].

The current literature emphasizes increased risk of adverse outcomes in the presence of proteinuria and hypertension.According to one study women who have gestational hypertension or preeclampsia have increased rates of preterm delivery and delivery of small-for-gestational-age infants as compared to women having uncomplicated pregnancies[18].

This study shows that 9.6% of cases had preterm birth and 8 % had IUGR. These findings are in accordance with another study conducted by Powers RW et al 2008 and they concluded that the risk of preterm birth was 14.7-fold higher and the risk of small for gestational age (SGA) was 6.8-fold higher in women with preeclampsia, hyperuricemia, compared with normotensive women[19]. Although the etiology of preterm birth is heterogeneous, it is likely that ischemic placental tissue may serve as an important pathway to preterm births[20].

Pregnancy outcome of this study showed that hypertension during pregnancy has great influence on neonatal outcomes. Adverse pregnancy outcomes includes still births, intrauterine death, IUD, IUGR, and termination of pregnancy. The association between chronic hypertension and placental abruption is strong; and ischemic placental disease for examples PIH modified this relationship. So hypertension in pregnancy influences on fetal and maternal outcomes[21].

A total of 22.45% patients had planned C-section. Among indications of Caesarean section uncontrolled hypertension during pregnancy and/or preeclampsia was also included. Bao SH, etall analyzed the outcome of mother and baby in 487 cases of pregnancy induced hypertension (PIH) delivered by Cesarean section (CS). There was no maternal or fetal death. So many authors suggest that CS should be done whenever eclampsia could not be put under control in order to save both mother and baby[22]. Comparison of

the two study group showed that 29.6% of the cases were those who were presented with uncontrolled hypertension in early pregnancy and were decided to be managed conservatively aiming to prolong pregnancy as close to term.

Pregnancy-induced hypertension, intrauterine growth retardation, preterm delivery and placental abruptionall share an etiological factor or represent different clinical expressions of recurring placental dysfunction. Chronic hypertension and diabetes mellitus may cause or aggravate such dysfunction thus causing placental abruption. A history of Caesarean section is associated with an increased risk of placental abruption[23].

CONCLUSIONS

The women with hypertension during pregnancy have greater risk of having adverse pregnancy outcome as compared to normotensive pregnant women. History of pregnancy induced hypertension, and women age was identified as risk factors for developing hypertensive disorders of pregnancy.

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over old griefs.

Euripides