

Risk Factors of Pregnancy Induced Hypertension in Falluja City

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Abstract

Background: Hypertensive disorders of pregnancy are the most common problems during pregnancy in Iraq as a developing country. Several risk factors have been described as predisponent to hypertensive disorders in pregnancy worldwide.

There haven't been any studies investigating the risk factors of pregnancy induced hypertension in Falluja , Anbar governorate.

Objectives: The aim of this study is to find out associations between certain implicated risk factors and their extent on pregnancy induced hypertension.

Patients and Methods: A hospital and main primary health care centers based group matched case-control study was undertaken, the data collected during the period from September 2013 to January 2014. A structured questionnaire was developed and designed for the purpose of the study. Both cases and controls were interviewed after taking verbal consent.

The study consisted of 100 patients with pregnancy induced hypertension cases confirmed on the diagnosis by specialists Obstetricians & Gynecologists & Family physicians and 200 group -matched healthy pregnant controls. Bivariate analyses included odds ratio (OR), and 95% confidence interval (CI) for odds ratio were performed to explore such associations.

Results: The study shows that the significant risk factors of pregnancy induced hypertension are the two extremes of maternal age , passive and active smoking , primigravida and multipara (≥ 5) , assisted vaginal delivery and elective cesarean section, spacing between pregnancies ≥ 4 years , obesity and contraception methods especially oral and injectable. Family and previous history of pregnancy induced hypertension were positively associated with risk of pregnancy induced hypertension.

Conclusion: The study showed significant associations between two extremes of maternal age, smoking, multiparous (≥ 5), assisted vaginal delivery and elective cesarean section,

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Introduction

Hypertensive disorders are the most common medical complication of pregnancy^[1]. The spectrum of disease ranges from mildly elevated blood pressure with minimal clinical significance to severe hypertension and multi-organ dysfunction^[2]. Understanding the disease process and the impact of hypertensive disorders on pregnancy is of the most

importance, because these disorders remain a major cause of maternal and perinatal morbidity and mortality worldwide^[3]. In both developed and developing countries genetic aspect for PIH within families has been recognized since 19th century suggesting a genetic component of the disorder^[4].

Gestational hypertension in the early stages of pregnancy has been shown to improve the health of the child both in its first year of life, and its later life. It has been proposed that fetal genes designed to increase the mother's blood pressure are so beneficial that they outweigh the potential negative effects that can come from preeclampsia^[5].

Several studies have analyzed the risk factors for pregnancy induced hypertension, and the identified risk factors include nulliparity, age > 40, obesity, a family history of hypertension, heart failure, stroke and diabetes mellitus and smoking^[6].

The aim of the study is to find out associations between certain implicated risk factors and their extent on pregnancy induced hypertension in Falluja City.

Patients and Methods:

This is a retrospective case control study conducted in Fallujah district, Western Iraq.

The study was conducted in six Main Primary Health Care Centers, and Maternal and Children Teaching Hospital of Falluja, the maternity services of which are referral for high risk pregnant women throughout the district which covers 500,000 population of which 4% pregnant women and 22% women in reproductive age (according to Falluja health sector statistics 2012). The data collected during the period from September 2013 to January 2014.

For each case, two controls were chosen and matched as pregnant. Sampling was convenience samples which made up of women with the inclusion criteria for both cases and controls. Inclusion criteria include the following:

Pregnant female of more than twenty weeks gestation and live in Falluja with hypertensive disorders were enrolled as cases, while pregnant women without

complications were enrolled as control individuals in this study.

While exclusion criteria include pregnant women with gestational or pre-pregnancy diabetes mellitus, thyroid disease (hypo, and hyperthyroidism), autoimmune disease such as (systemic lupus erythromatosis, rheumatoid arthritis), or diagnosed with heart or renal diseases, or neuropathy before pregnancy, were excluded from the study. The response rate was 90% for both cases and controls.

The study sample thus consisted of 100 cases and 200 controls. Socio-demographic factors, family-related factors, pregnancy-associated factors, were investigated with respect to pregnancy induced hypertension through well-designed questionnaire.

Statistical analysis: The collected data were analyzed by using SPSS (Version 22). Odds ratio and 95% Confidence Interval (CI) were calculated for every risk factor of concern with its P value (<0.05) was considered as significant.

Results:

Table 1 showed that maternal age less than 18 and 35 or more was significantly associated with high risk of pregnancy induced hypertension (OR=2.32, CI=1.25-4.33, P=0.007) and (OR=4.95, CI=2.71-9.05, P=0.0001) respectively. As regards passive smoking, it was found to be significantly associated with risk of pregnancy induced hypertension (OR=2.39, CI=1.41-4.05, P=0.001).

While primi gravida (nulliparous), and multi para5 and more were also found to be significantly associated with risk of pregnancy induced hypertension (OR=2.98, CI=1.61-5.54, P = 0.0004) and (OR = 7.61, CI = 3.87-15.00, P =0.0001). Regarding family history of [PIH, PET, placental abnormality], it was highly significantly associated with risk of pregnancy induced hypertension.

Concerning the body mass index, obese patients were at nearly three times risk with pregnancy induced hypertension (OR=2.87, CI=1.24-6.66, P=0.01).

Contraception users were also found to have three times significant risk of pregnancy induced hypertension compared to non-users (OR=2.96, CI=1.71-5.13, P=0.0001).

Previous use of oral contraception was associated with 5 times risk, while injectable type of contraception predispose the pregnant woman to more than 9 times risk of pregnancy induced hypertension (OR=5.48, CI=2.91-10.30, P=0.0001) and (OR=9.65, CI=2.31-40.35, P=0.0003) respectively (Table 1).

As concerns the type of labor (for multipara), assisted vaginal delivery and elective cesarean section, it was found to be significantly associated with risk of pregnancy induced hypertension (OR = 1.2, CI=0.1-0.5, P=0.001) and (OR=1.3, CI=2.45-7.78, P=0.001). (Table 2)

Past history of pregnancy induced hypertension was found to be a significant risk factor also.

Regarding spacing between pregnancies, 4-5 years spacing and (six years and more) interval were found to be significantly associated with risk of pregnancy induced hypertension (OR=3.37, CI=1.62-8.23, P=0.001) and (OR=8.14, CI=2.3-28.3, P=0.0001). So the longer the interval in between pregnancies is, the higher the risk of PIH. (Table 2)

Table-1 Risk factors of Pregnancy Induced Hypertension

Risk factor	Case n(100)		Control n(200)		OR	Confidence Interval 95%		P value
	No.	%	No.	%		L	H	
Age(years)								
≤18 years	25	25	40	20	2.32	1.25	4.33	0.007
19-34	35	35	130	65	-	-	-	-
≥35 years	40	40	30	15	4.95	2.71	9.05	0.0001
Smoking								
Passive	40	40	45	22.5	2.39	1.41	4.05	0.001
Active	5	5	7	3.5	1.92	0.59	6.31	0.274
No	55	55	148	74	-	-	-	-
Parity								
Nulli para	39	39	68	34	2.98	1.61	5.54	0.0004
1-4	20	20	104	52	-	-	-	-
≥5	41	41	28	14	7.61	3.87	15.00	0.0001
Family history								
Yes	61	61	6	3	34	19	58.4	0.001
No	39	39	194	97	-	-	-	-
BMI								
18.5-24.9	18	18	49	24.5	-	-	-	-
25-29.9	63	63	133	66.5	1.29	0.70	2.39	0.419
≥30	19	19	18	9	2.87	1.24	6.66	0.013
Contraception								
Yes	78	78	109	54.5	2.96	1.71	5.13	0.0001
No	22	22	91	45.5	-	-	-	-
Pills	49	49	37	18.5	5.48	2.91	10.30	0.0001
Injectable	7	7	3	1.5	9.65	2.31	40.35	0.0003

Table- 2 Other Risk Factors in Multiparous Women

Risk factor	Case n(61)		Control n(132)		OR	Confidence Interval 95%		P value
	No.	%	No.	%		L	H	
Previous delivery type								
NVD	9	14.75	104	78.78	-	-	-	-
Assisted VD	20	32.78	١٢	9.1	1.2	0.1	0.5	0.001
Elictive C/S	32	52.45	١٦	12.12	1.3	2.45	7.78	0.001
Previous history								
Yes	٤١	67.21	22	16.66	9.8	5.2	18.8	0.0001
No	٢٠	32.78	110	83.33	-	-	-	-
Spacing								
≤1 year	١٠	16.39	90	68.18	0.2	0.1	0.7	0.01
2-3	٢٠	32.78	32	24.24	-	-	-	-
4-5	٢٠	32.78	9	6.81	3.37	1.62	8.23	0.001
≥6 years	١١	18.03	1	0.75	8.14	2.3	28.3	0.0001

Discussion

In the present study the two extremes of maternal age in Falluja are risky for pregnancy induced hypertension. This is in keeping with Lawoyin TO study which also concluded that the extremes of maternal age increases the risk for pregnancy induced hypertension in a case-control study in Saudi Arabia in 1996[7]. Owiredu et al stated that the women aged > 35 years (9% of 50 cases) increases risk for pregnancy induced hypertension in a study about risk factors of pregnancy induced hypertension among Ghanaian pregnant women in 2006-2007[8]. Which also parallel with the result of the current study.

In the present study passive and active smokers had increase risk for pregnancy induced hypertension significantly. The explanation of passive smoking risk could be related to air pollution according to findings from a new university of Florida study (9-10). A case-control study in primary health centers Al-Washash and Bab-Almoatham in Baghdad 2013 agrees with the present study results that current smokers have four folds increase risk for pregnancy induced hypertension^[11].

Also Silva et al reported that the association between smoking and blood pressure during pregnancy is significant^[12]. Paradoxically, maternal smoking may decrease the risk of PIH and pre-eclampsia^[13]. A prospective Cohort based study in Swedish medical birth register in 1997 found that maternal smoking decreases significantly risk for pregnancy induced hypertension and preeclampsia^[14]. This disagreement may be due to contrast in time and place of the studies.

The present study revealed that pregnancy induced hypertension was more common among primigravida and multipara ≥5). The findings could be explained by biological and immunological factors. Owiredu et al stated that null parity has increased risk for developing pregnancy induced hypertension and preeclampsia and this agrees with the present study results^[8]. Findings which are in contrast to the findings of another case-control study in Baghdad 2013 which found the group of para [two to three] is a significant risk factor for pregnancy induced hypertension^[11].

In this study, the rate of positive family history of (PIH and PET in first degree relatives) was 61% of the total one hundred cases of pregnancy induced hypertension enrolled in the present study and had high risk for pregnancy induced hypertension. The findings could be explained genetically and immunologically. A case-control study in primary health centers in Baghdad 2013 agrees with the present study results in that positive family history of hypertension during pregnancy is a significant risk factor^[11].

Results of this study also revealed that the rate of normal body mass index, overweight, and obese were 18%, 63% and 19% respectively, obese cases had high risk for pregnancy induced hypertension. The underlying mechanisms unknown, but it was proposed that the elevated baseline cardiac output in obese women, when augmented by further pregnancy-associated hemodynamic alterations, may exceed the capacity of vasodilation. As a result, obese women may develop hypertension while sustaining the increased blood flow, exacerbating the endothelial injury and leading to the clinical sequelae of preeclampsia^[15]. A case-control study at Shahid Akbarabadi hospital in south Tehran agrees with the present study results in that obese pregnant women have 4.5 folds risk for gestational hypertension^[16].

In the present study the group of using contraception (all types) represents 78% of cases, have risk for pregnancy induced hypertension.

Those who use oral or injectable contraception represents 49% and 7% of cases respectively, and both have significant risk for pregnancy induced hypertension. The risk of gestational hypertension could be increased with the increase in the potency of progestin in contraceptive pills. At 2006-2007, Owiredi et al did a study of risk factors of

pregnancy induced hypertension among Ghanaian pregnant women claimed that contraceptive pills usage represent 37% risk for pregnancy induced hypertension^[8].

In the present study, the rate of caesarean delivery, vaginal delivery and assisted delivery were 52.45%, 14.75% and 32.78% respectively, the results revealed that caesarean delivery and assisted delivery had significant association with pregnancy induced hypertension. Because delivery remains the only known cure for pregnancy induced hypertension and preeclampsia the therapy of choice will be near term induction of labor. An article of maternal and perinatal outcome in nulliparous women complicated by pregnancy induced hypertension in Imam Reza hospital, women health researches centre in Mashhad- Iran agrees with the present study in that elective cesarean section increases risk for pregnancy induced hypertension^[17]. Cesarean section is reported to increase the rate of pregnancy induced hypertension in other studies^[18,19].

The present study revealed that the rate of positive previous history of PIH and PET was 67% of the sixty one cases of pregnancy induced hypertension enrolled in the study and had risk for pregnancy induced hypertension which agrees with a cohort study among Dutch pregnant women 2008 in that positive previous history of pregnancy induced hypertension, preeclampsia and placental abnormalities is highly significant risk for pregnancy induced hypertension^[12].

Birth space of four to five years was found to have 3.4 folds increment of risk for pregnancy induced hypertension. While 6 years or more spacing had eight folds risk for pregnancy induced hypertension. These results are in agreement with a Norwegian population study which concluded that there is association between risk to pregnancy induced hypertension and spacing with probability of increase by

1.12 times for each year increase in interval^[20]. A case-control study in Baghdad 2013 agrees with the present study results in that the one year interval is protective and significant, while interval of more than three years disagrees with the present study^[11].

Conclusion

Risk factors for pregnancy induced hypertensive in Falluja, Anbar seem to include two extremes of maternal age, smoking, nulliparity, multiparity (≥ 5), assisted vaginal delivery and elective cesarean section, spacing (≥ 4 years), obesity and oral and injectable contraceptives, and family or personal histories of hypertension. The knowledge about these factors seems to lay the tracks for its prevention in Anbar.

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