

Impact of Pregnancy Induced Hypertension Upon Fetal Risk During Second and Third Trimester: A Follow-Up Study

ZAINAB YASEEN MAJEED¹, NUHA ADEL IBRAHIM²

¹Academic Nurse, Qadisiyah Health Directorate-Iraq

²Assist. Prof. PhD, Maternal and Neonate Nursing/ College of Nursing/ University of Baghdad-Iraq

Correspondence to: Zainab Yaseen Majeed, Email: zainab.yassin1203a@conursing.uobaghdad.edu.iq

ABSTRACT

Objective: The study was aimed to investigate the impact of pregnancy-induced hypertension on fetal risk during the second and third trimesters.

Methods: The descriptive cross-sectional study design approach is done in AL-Diwaniyah City/ Iraq, by interrogating members of the study population, with the aim of describing the studied phenomenon. To conduct the study, a non-probability (purposive) sample of (72) they were monitored and evaluated during two periods (during second and third trimester). The instrument dependability was established through a pilot research, and it was subsequently presented to experts for validation. The information was collected through interview and analyzed using descriptive and inferential statistical data analysis.

Results: Out of 72 participants aged 30-34 years from urban residents and housewife and demonstrated that the impact of pregnancy induced hypertension in second trimester upon fetal were low impact as described by higher mean and standard deviation 16.44 (± 1.65). While, a moderate impact of pregnancy induced hypertension upon fetal in third trimester at moderate mean and standard deviation 14.67 (± 2.16). There is significant difference in impact of pregnancy induced hypertension upon fetal between second (low impact) and third (moderate impact) trimester ($t=7.079$; $p=0.001$).

Conclusions: Pregnancy induced hypertension in terms of impact, women expressed a moderate fetal impact in two period of measurement second and third trimester (significant fetal impact associated higher the gestational age). Health education and providing a realistic picture of the dangers and difficulties of pregnancy can help reduce pregnancy risks. A handbook brochure on pregnancy hazards and how to handle them should.

Keywords: Impact, Pregnancy Induced Hypertension, Fetal Risk.

INTRODUCTION

Gestational hypertension and preeclampsia are all examples of pregnancy-induced hypertension (PIH), which is defined as new high blood pressure with or without proteinuria that develops at 20 weeks or more of gestational age [1]. Hypertension is defined as a persistent systolic blood pressure of 140 mmHg or a diastolic blood pressure of 90 mmHg based on an average of at least two readings done in the same arm [2]. In both developed and developing countries, PIH is a major public health concern, contributing to the high rate of perinatal mortality [3]. PIH complicates 2–8% of pregnancies in the Western world [4]. PIH, on the other hand, can be as high as 16.7% in poor countries [5]. Furthermore, the available studies revealed a significant prevalence of PIH, ranging from 2.23 to 18.25 percent [6]. Similarly, a study in Tigray regional state found that PIH was one of the leading causes of maternal mortality in the region, with an incidence rate of 8.1 percent, which was higher than the national pooled prevalence of PIH (6.29 percent) [7]. Preterm birth risk was lowest in normotensive moms (7.2 percent), greater in mothers with PIH (12.5 percent), and highest in women with preeclampsia (39.2 percent) [8]. Preterm birth, low birth weight, birth asphyxia, stillbirth, and early neonatal death have all been linked to pregnancy-induced hypertension [9]. Similarly, research in Africa found that perinatal death, low birth weight, premature birth, and birth asphyxia were linked to PIH [10]. However, the risk and incidence of adverse perinatal outcomes of PIH vary across countries, populations and ethnic-geographic areas [11]. Therefore, this study aimed to investigate the impact of

pregnancy induced hypertension on fetal risk during second and third trimester.

MATERIAL AND METHODS

The descriptive cross-sectional study design approach is done by follow-up members of the study population (pregnant), with the aim of describing the studied phenomenon in terms of its nature and degree of existence only.

To conduct the study, a non-probability (purposive) sample of (72) pregnant followed during second and third trimester, through the use questionnaire for investigation.

Validity was determined by a panel of 11 arbitrators who were asked to comment on each component of the study questionnaire in terms of language appropriateness, correlation with the dimension of study variables to which it was assigned, and suitability for the study population. Data was obtained from pregnant to assess the questionnaire's reliability, and the test was delivered to 10 people from the study population who were not part of the initial sample. The Cronbach's alpha by the test-retest was found to be 0.82.

After obtaining the approval of the Qadisiyah Health Directorate and verifying the validity and reliability of the questionnaire. The researcher interviewed himself (face to face) to the participants, explained the instructions, answered their questions regarding the form, urged them to participate and thanked them for the cooperation. The interview techniques was used on individual bases, and each interview took (30) minutes after taking the important steps that must be included in the study design.

The SPSS ver-20.0 software application was used to conduct statistical analysis. The information was evenly distributed. Paired sample t test were used to examine variations based on second and third investigations. For continuous variables, descriptive data is reported as mean standard deviation, and for categorical variables, it is shown as number (percent). Statistical significance was defined as a p 0.05.

RESULTS

Table 1 shows the frequencies and percentages of 72 pregnant study participants aged 35 and older (29.2 percent). More than half of the residents in the study sample were city dwellers (72.2 percent). In terms of educational attainment, secondary school graduates have the largest rate (38.9 percent). The majority of the study sample (75 percent) were housewives, according to occupation statistics. The sufficient were personated (54.2 percent) and never related as kinship in terms of monthly income (38.9 percent).

In terms of statistical mean, this table demonstrated that the low fetal impact at second trimester as indicated by higher mean of scores ($M \geq 1.68$) at all studied items except, the moderate impact in terms of (lack of fluid surrounding the fetus and lack of fetal movement) as indicated by moderate mean of scores ($M = 1.34-1.66$).

While, at third trimester, the responses were a moderate impact as indicated by moderate mean of scores ($M = 1.34-1.66$) at all studied items, except, the fetal high

impacted by pregnancy induced hypertension in terms of (lack of fetal movement) as indicated by low mean of scores ($M \leq 1.33$). As well as, the fetal low impacted in associated signs as (premature rupture of the amniotic membrane, fetal heartbeat disorder, fetal abnormalities and gene death) as indicated by higher mean of scores ($M \geq 1.67$).

Table 1: Socio-Demographic Characteristics

SDVs	Classification	Freq.	%
Age	<20 years	6	8.3
	20-24 years	6	8.3
	25-29 years	19	26.4
	30-34 years	20	27.8
	≥ 35 years	21	29.2
Residents	Urban	52	72.2
	Rural	20	27.8
Education level	Elementary school	22	30.5
	Secondary school	28	38.9
	College and above	22	30.6
Occupation	Employment	13	18.1
	Housewife	54	75.0
	Unemployment	5	6.9
Income/ monthly	Sufficient	39	54.2
	Sufficient to certain limit	21	29.1
	Insufficient	12	16.7
Kinship relationship between spouses	Never	28	38.8
	First degree	22	30.6
	Second degree	22	30.6

Table 2: Impact of Pregnancy Induced Hypertension upon Maternal Risk

List	Fetal Risk	Class	2 nd Semester				3 rd Trimester			
			f	%	M.s	Ass.	f	%	M.s	Ass.
1	Premature rupture of the amniotic membrane	Yes	3	4.2	1.96	L	16	22.2	1.78	L
		No	69	95.8			56	77.8		
2	Lack of fluid surrounding the fetus	Yes	25	34.7	1.65	M	40	55.6	1.44	M
		No	47	65.3			32	44.4		
3	Premature birth	Yes	6	8.3	1.92	L	32	44.4	1.56	M
		No	66	91.7			40	55.6		
4	Low fetal weight	Yes	4	5.6	1.94	L	33	45.8	1.54	M
		No	68	94.4			39	54.2		
5	Intrauterine growth retardation	Yes	8	11.1	1.89	L	33	45.8	1.54	M
		No	64	88.9			39	54.2		
6	Fetal heartbeat disorder	Yes	22	30.6	1.69	L	18	25.0	1.75	L
		No	50	69.4			54	75.0		
7	Lack of fetal movement	Yes	35	48.6	1.51	M	52	72.2	1.28	H
		No	37	51.4			20	27.8		
8	Fetal abnormalities	Yes	7	9.7	1.9	L	7	9.7	1.90	L
		No	65	90.3			65	90.3		
9	Gene death	Yes	2	2.8	1.97	L	9	12.5	1.88	L
		No	70	97.2			63	87.5		

Table 3: Overall Impact of Pregnancy Induced Hypertension upon Fetal Risk

Fetal Impact	2 nd Trimester			3 rd Trimester		
	Freq.	%	M \pm SD	Freq.	%	M \pm SD
High (M=9-12)	4	5.6	16.44 \pm 1.65	13	18.1	14.67 \pm 2.16
Moderate (M=12.1-15)	5	6.9		30	41.7	
Low (M=15.1-18)	63	87.5		29	40.3	
Total	72	100.0		72	100.0	

Findings demonstrated that the impact of pregnancy induced hypertension in second trimester upon fetal were low impact as described by higher mean and standard deviation 16.44 (± 1.65). While, a moderate impact of pregnancy induced hypertension upon fetal in third trimester at moderate mean and standard deviation 14.67 (± 2.16).

Table 4: Difference in Impact of Pregnancy Induced Hypertension upon Fetal Risk in Second and Third Trimester

Fetal Risk	Groups	Mean	SD	Paired test	d.f	p-value
	2 nd Trimester	1.82	.183	7.079	71	0.001
3 rd Trimester	1.62	.240				

Findings illustrated that there is significant difference in impact of pregnancy induced hypertension upon fetal between second (low impact) and third (moderate impact) trimester ($t=7.079$; $p=0.001$).

DISCUSSION

In terms of frequencies and percentage, out of 72 pregnant participants in study aged 35 years and older (29.2%). In regards with residents, more than half of studied sample were urban residents (72.2%). Respected to the educational level, the secondary school graduated were records the highest percentage (38.9%). Occupation related findings, it is obvious that most of study sample (75%) were housewife. In terms of monthly income, the sufficient were personated (54.2%) and never related as kinship (38.9%). This findings in the same line with findings from Al-Dewania who reported that the most of sample their age between 30–34.9 years [12]. Concerning residents, this findings corresponding with findings from AL-Basra Maternity and Children Hospital, depicted findings that most of the pregnant women residence at in urban [13]. This may be due to most pregnant women who attendance the hospital live in urban area, while not all pregnant women in rural area attendance the hospital, different reasons: culture, believes, values, as well as selected home delivery rather than hospital delivery. Regarding occupation, this findings go along with Khalid and Mohammed (2021), who illustrated that most pregnant women were housewife [13]. This is due to the economic conditions that Iraq is going through from financial crises and the lack of job grades. Concerning income, monthly income, the sufficient, this findings incongruent with Hafidh and Ali (2020), who found that that more than two-thirds of the participants in the study sample were not enough for their monthly income to meet their needs [13]. This is due to several reasons, including: the husband is a gainer and the wife is not an employee, the wage that the husband receives is not sufficient to meet the family's daily needs, especially in these conditions that Iraq is going through from curfew (staying at home) due to the Corona pandemic, and the high prices of goods and materials necessary for each family.

In terms of statistical mean, findings demonstrated that the low fetal impact at second Except for the moderate influence in terms of (lack of fluid surrounding the fetus and absence of fetal movement) as evidenced by moderate mean of scores ($M=1.34-1.67$), trimester was indicated by higher mean of scores ($M1.68$) for all analyzed items. While at the third trimester, the responses had a moderate impact as demonstrated by moderate mean of scores ($M=1.34-1.67$) for all studied items, except for the fetal high impacted by pregnancy induced hypertension in terms of (lack of fetal movement), which had a low mean of scores ($M1.33$). Furthermore, as evidenced by a greater mean of sores ($M1.68$), fetal low impacted linked indications such as (premature rupture of the amniotic membrane, fetal heartbeat abnormality, fetal abnormalities, and gene death). Preeclampsia increases the likelihood of intrauterine growth restriction and low birth weight,

according to a study by Xiong et al. (2009) [14]. In the same vein, Obaid et al. (2013) found that newborns of mothers with preeclampsia were more likely to have SGA 27 (49%) and RDS 6 (10.1%), and that the frequency of preterm delivery at 37 weeks' gestation grew dramatically with increasing severity of maternal hypertension 16 (29 percent). Fetal distress was observed in 12 cases (21.8%), with meconium staining of the fluid in 8 cases (14.5%), and 33 neonates (60%) required care for a variety of reasons. Mothers with hypertension have a higher risk of antepartum hemorrhage, with 40 (72%) delivering naturally and 38 via caesarean section (70 percent) [15].

The results showed that pregnancy-induced hypertension in the second trimester had a low impact on fetal outcomes, as evidenced by a greater mean and standard deviation of 16.44 (1.65). In the third trimester, there was a moderate impact of pregnancy-induced hypertension on fetal blood pressure, with a moderate mean and standard deviation of 14.67 (2.16). This finding is consistent with Majeed et al. (2020), who conducted a study on PE and found that it had significant problems in terms of newborn outcomes LBW. Except for LBW, where the adjusted OR could not approach significance, the ORs of CS and LBW were significant in crude models and after correcting for confounding factors [16].

The findings revealed that the influence of pregnancy-induced hypertension on fetal outcomes differs significantly between the second (low impact) and third (moderate impact) trimesters ($t=7.079$; $p=0.001$). This research supports the findings of Baulon et al. (2005), who found that infants born to moms who have PIH but no IUGR had normal early infant growth. At 28 and 42 days postpartum, IUGR caused by PIH is linked to considerable catch-up growth [17].

CONCLUSIONS

Pregnancy induced hypertension in terms of impact, women expressed a moderate fetal impact in two period of measurement second and third trimester (significant fetal impact associated higher the gestational age). Health education and providing a realistic picture of the dangers and difficulties of pregnancy can help reduce pregnancy risks. A handbook brochure on pregnancy hazards and how to handle them should.

REFERENCES

1. Mikami, Y., Takagi, K., Itaya, Y., Ono, Y., Matsumura, H., Takai, Y., & Seki, H. (2014). Post-partum recovery course in patients with gestational hypertension and pre-eclampsia. *Journal of Obstetrics and Gynaecology Research*, 40(4), 919-925.
2. Shen, M., Smith, G. N., Rodger, M., White, R. R., Walker, M. C., & Wen, S. W. (2017). Comparison of risk factors and outcomes of gestational hypertension and pre-eclampsia. *PloS one*, 12(4), e0175914.

3. Kintiraki, E., Papakatsika, S., Kotronis, G., Goulis, D. G., & Kotsis, V. (2015). Pregnancy-induced hypertension. *Hormones*, 14(2), 211-223.
4. Ephraim, R. K. D., Osakunor, D. N. M., Denkyira, S. W., Eshun, H., Amoah, S., & Anto, E. O. (2014). Serum calcium and magnesium levels in women presenting with pre-eclampsia and pregnancy-induced hypertension: a case-control study in the Cape Coast metropolis, Ghana. *BMC pregnancy and childbirth*, 14(1), 1-8.
5. Molvi, S. N., Mir, S., Rana, V. S., Jabeen, F., & Malik, A. R. (2012). Role of antihypertensive therapy in mild to moderate pregnancy-induced hypertension: a prospective randomized study comparing labetalol with alpha methyl dopa. *Archives of gynecology and obstetrics*, 285(6), 1553-1562.
6. Berhe, A. K., Ilesanmi, A. O., Aimakhu, C. O., & Mulugeta, A. (2020). Effect of pregnancy induced hypertension on adverse perinatal outcomes in Tigray regional state, Ethiopia: a prospective cohort study. *BMC pregnancy and childbirth*, 20(1), 1-11.
7. Jin, W. Y., Lin, S. L., Hou, R. L., Chen, X. Y., Han, T., Jin, Y., ... & Zhao, Z. Y. (2016). Associations between maternal lipid profile and pregnancy complications and perinatal outcomes: a population-based study from China. *BMC pregnancy and childbirth*, 16(1), 1-9.
8. Shen, M., Smith, G. N., Rodger, M., White, R. R., Walker, M. C., & Wen, S. W. (2017). Comparison of risk factors and outcomes of gestational hypertension and pre-eclampsia. *PloS one*, 12(4), e0175914.
9. Kampruan, R., Sukonpan, K., & Wasinghon, P. (2016). Pregnancy outcomes amongst normotensive and severe pre-eclampsia with or without underlying chronic hypertension pregnancy. *Thai Journal of Obstetrics and Gynaecology*, 202-208.
10. Muti, M., Tshimanga, M., Notion, G. T., Bangure, D., & Chonzi, P. (2015). Prevalence of pregnancy induced hypertension and pregnancy outcomes among women seeking maternity services in Harare, Zimbabwe. *BMC cardiovascular disorders*, 15(1), 1-8.
11. Nathan, H. L., Seed, P. T., Hezelgrave, N. L., De Greeff, A., Lawley, E., Conti-Ramsden, F., ... & Shennan, A. H. (2018). Maternal and perinatal adverse outcomes in women with pre-eclampsia cared for at facility-level in South Africa: a prospective cohort study. *Journal of global health*, 8(2).
12. Xu, T. T., Zhou, F., Deng, C. Y., Huang, G. Q., Li, J. K., & Wang, X. D. (2015). Low-Dose aspirin for preventing preeclampsia and its complications: a meta-analysis. *The Journal of Clinical Hypertension*, 17(7), 567-573.
13. Lewandowska, M., Więckowska, B., & Sajdak, S. (2020). Pre-pregnancy obesity, excessive gestational weight gain, and the risk of pregnancy-induced hypertension and gestational diabetes mellitus. *Journal of clinical medicine*, 9(6), 1980.
14. Xiong, X., Mayes, D., Demianczuk, N., Olson, D. M., Davidge, S. T., Newburn-Cook, C., & Saunders, L. D. (2009). Impact of pregnancy-induced hypertension on fetal growth. *American journal of obstetrics and gynecology*, 180(1), 207-213.
15. Obaid, K. A., Kadoori, M. B., & Baker, G. M. (2013). Effect of maternal hypertension on neonatal outcome in Diyala Province, Iraq. *Diyala Journal of Medicine*, 5(2), 68-73.
16. Majeed, B. A., Jasim, S. K., Al-Momen, H., & Hussein, M. J. (2020). Iraqi Women with Preeclampsia: Maternal and Neonatal Outcomes. *Open Access Macedonian Journal of Medical Sciences*, 8(B), 866-870.
17. Baulon, E., Fraser, W. D., Piedboeuf, B., Buekens, P., & Xiong, X. (2005). Pregnancy-induced hypertension and infant growth at 28 and 42 days postpartum. *BMC pregnancy and childbirth*, 5(1), 1-7.