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Impact of pregnancy induced hypertension upon maternal risk during second and third trimester: A follow-up study

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Abstract---Background: Pregnancy-induced hypertension was more common in Iraqi women, especially among young women. However, nothing is known regarding the negative effects of different gestational ages. As a result, the aims of this study was to investigate the impact of pregnancy-induced hypertension upon maternal risk during the second and third trimesters. Methods: The descriptive cross-sectional study design approach is conducted 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 demonstrated that the impact of pregnancy induced hypertension in second trimester upon pregnant women were moderate as described by moderate mean and standard deviation 36.57 (± 2.73). While, a moderate impact of pregnancy induced hypertension in third trimester at moderate mean and standard deviation 33.19 (± 4.52). There were significant difference in impact of pregnancy induced hypertension upon pregnant women between second and third trimester ($t=6.357$; $p=0.001$). Conclusions: Pregnancy induced hypertension in terms of impact, women expressed a moderate impact in two period of measurement second and third trimester (significant 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 be created. Write in easy language and include appealing images offered to the woman and family.

Keywords---Impact, Pregnancy Induced Hypertension, Maternal 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 (Mikami et al.,2014) 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 (Shen et al.,2017). In both developed and developing countries, PIH is a major public health concern, contributing to the high rate of perinatal mortality (Kintiraki et al.,2015). PIH complicates 2–8% of pregnancies in the Western world (Ephraim et al.,2014). PIH, on the other hand, can be as high as 16.7% in poor countries (Molvi et al.,2012). Furthermore, the available studies revealed a significant prevalence of PIH, ranging from 2.23 to 18.25 percent (Berhe et al.,2020).

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) (Jin et al.,2016). Preterm birth, low birth weight, birth asphyxia, stillbirth, and early neonatal death have all been linked to pregnancy-induced hypertension (Xu et al.,2015; Lewandowska et al.,2020; La-Orpipat, and Suwanrath, 2019) Similarly, research in Africa found that perinatal death, low birth weight, premature birth, and birth asphyxia were linked to PIH (Kintiraki et al.,2015;Bener,2013, Haney et al.,2013). However, the risk and incidence of PIH-related poor prenatal outcomes differ by country, population, and ethnic-geographic location. Therefore, this study aimed to investigate the impact of pregnancy induced hypertension on maternal risk during second and third trimester.

Method

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.

Result

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).

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	Maternal Risk	Clas s	2 nd Semester				3 rd Trimester			
			f	%	M.s	As s.	f	%	M.s	As s.
1	Do you have a headache (headache)	Yes	6	91.	1.0	H	7	98.	1.01	H
		No	6	7	8		1	6		
2	Severe headache, unbearable	Yes	6	8.3			1	1.4		
		No	3	51.	1.4	M	4	68.	1.32	H
			7	4	9		9	1		
		No	3	48.			2	31.		
			5	6			3	9		
3	Edema (swelling) of the face, hands and extremities	Yes	2	40.	1.6	M	3	54.	1.46	M
		No	9	3	0		9	2		
			4	59.			3	45.		
			3	7			3	8		
4	Blurred vision	Yes	1	19.	1.8	L	2	38.	1.61	M
		No	4	4	1		8	9		
			5	80.			4	61.		
			8	6			4	1		
5	Epilepsy-like seizure	Yes	5	6.9	1.9	L	1	26.	1.74	L
		No			3		9	4		
			6	93.			5	73.		
			7	1			3	6		
6	Vertigo / dizziness	Yes	5	79.	1.2	H	6	87.	1.13	H
		No	7	2	1		3	5		
			1	20.			9	12.		
			5	8				5		
7	Less frequent urination	Yes	3	51.	1.4	M	4	59.	1.40	M
		No	7	4	9		3	7		
			3	48.			2	40.		
			5	6			9	3		
8	Nausea and vomiting	Yes	5	80.	1.1	H	6	84.	1.15	H
		No	8	6	9		1	7		
			1	19.			1	15.		
			4	4			1	3		
9	Light sensitive	Yes	1	22.	1.7	L	2	38.	1.61	M
		No	6	2	8		8	9		
			5	77.			4	61.		
			6	8			4	1		
1	Severe pain in the upper	Yes	5	69.	1.3	H	5	75.	1.25	H
0	abdomen on the right side	No	0	4	1		4	0		
			2	30.			1	25.		
			2	6			8	0		
1	Heartburn	Yes	6	87.	1.1	H	6	90.	1.10	H
1		No	3	5	3		5	3		
			9	12.			7	9.7		
				5						
1	Kidney failure	Yes	3	4.2	1.9	L	2	31.	1.68	L

2				6		3	9		
		No	6	95.		4	68.		
			9	8		9	1		
1	Presence of protein in urine	Yes	3	50.	1.5	M	4	59.	1.40 M
3			6	0	0		3	7	
		No	3	50.			2	40.	
			6	0			9	3	
1	Blood clotting	Yes	4	59.	1.4	M	5	75.	1.25 H
4			3	7	0		4	0	
		No	2	40.			1	25.	
			9	3			8	0	
1	Unconsciousness	Yes	4	5.6	1.9	L	2	27.	1.72 L
5					4		0	8	
		No	6	94.			5	72.	
			8	4			2	2	
1	Breathing difficulties	Yes	4	68.	1.3	H	5	80.	1.19 H
6			9	1	2		8	6	
		No	2	31.			1	19.	
			3	9			4	4	
1	Heavy uterine bleeding	Yes	4	5.6	1.9	L	1	25.	1.75 L
7					4		8	0	
		No	6	94.			5	75.	
			8	4			4	0	
1	Frequent uterine contractions	Yes	2	29.	1.7	L	3	45.	1.54 L
8			1	2	1		3	8	
		No	5	70.			3	54.	
			1	8			9	2	
1	Liver problems	Yes	8	11.	1.8	L	2	31.	1.68 L
9				1	9		3	9	
		No	6	88.			4	68.	
			4	9			9	1	
2	Arrhythmia	Yes	5	69.	1.3	H	5	77.	1.22 H
0			0	4	1		6	8	
		No	2	30.			1	22.	
			2	6			6	2	
2	HELLP syndrome (elevated liver enzymes, low platelet count)	Yes	2	37.	1.6	M	3	50.	1.50 M
1			7	5	3		6	0	
		No	4	62.			3	50.	
			5	5			6	0	
2	Premature placental abruption	Yes	1	1.4	1.9	L	2	29.	1.71 L
2					9		1	2	
		No	7	98.			5	70.	
			1	6			1	8	
2	High blood sugar	Yes	1	1.4	1.9	L	1	23.	1.76 L
3					9		7	6	
		No	7	98.			5	76.	
			1	6			5	4	

In terms of statistical mean, this table demonstrated that the pregnant women at second trimester expressed a moderate responses to impact of pregnancy induced

hypertension as indicated by moderate mean of scores ($M=1.34-1.66$) at all studied items except, the pregnant women expressed responses were a high impact in terms of (headache, vertigo / dizziness, nausea and vomiting, sever pain, heartburn, breathing difficulties and arrhythmia) as indicated by low mean of scores ($M \leq 1.33$).

While, at third trimester, the responses were also a moderate impact as indicated by moderate mean of scores ($M=1.34-1.66$) at all studied items, except, the pregnant women expressed responses were a high impact in terms of (headache, severe headache (untreatable), vertigo / dizziness, nausea and vomiting, nausea and vomiting, sever pain, heartburn, blood clotting, breathing difficulties and arrhythmia) as indicated by low mean of scores ($M \leq 1.33$).

Table (3)
Overall Impact of Pregnancy Induced Hypertension upon Maternal Risk

<i>Maternal Impact</i>	<i>2nd Trimester</i>			<i>3rd Trimester</i>		
	<i>Freq.</i>	<i>%</i>	<i>M ± SD</i>	<i>Freq.</i>	<i>%</i>	<i>M ± SD</i>
High ($M=23-30.66$)	2	2.8	36.57 ± 2.73	13	18.1	33.19 ± 4.52
Moderate ($M=31.67-38.33$)	51	70.8		55	76.4	
Low ($M=39.34-46$)	19	26.4		4	5.6	
<i>Total</i>	72	100.0		72	100.0	

Findings demonstrated that the impact of pregnancy induced hypertension in second trimester upon pregnant women were moderate as described by moderate mean and standard deviation 36.57 (± 2.73). While, a moderate impact of pregnancy induced hypertension in third trimester at moderate mean and standard deviation 33.19 (± 4.52).

Table (4)
Difference in Impact of Pregnancy Induced Hypertension upon Maternal Risk in Second and Third Trimester

	<i>Groups</i>	<i>Mean</i>	<i>SD</i>	<i>Paired test</i>	<i>d.f</i>	<i>p-value</i>
Maternal Risk	2 nd Trimester	1.59	.118	6.357	71	0.001
	3 rd Trimester	1.44	.196			

Findings illustrated that there is significant difference in impact of pregnancy induced hypertension upon pregnant women between second and third trimester ($t=6.357$; $p=0.001$).

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 (Hafidh and Ali,2020).

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 (Khalid and Mohammed,2017).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 (Khalid and Mohammed,2017)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 Hafidh and Ali,2020).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, this table demonstrated that the pregnant women at second trimester expressed a moderate responses to impact of pregnancy induced hypertension as indicated by moderate mean of scores ($M=1.34-1.67$) at all studied items except, the pregnant women expressed responses were a high impact in terms of (headache, vertigo / dizziness, nausea and vomiting, sever pain, heartburn, breathing difficulties and arrhythmia) as indicated by low mean of scores ($M\leq 1.33$). While, at third trimester, the responses were also a moderate impact as indicated by moderate mean of scores ($M=1.34-1.67$) at all studied items, except, the pregnant women expressed responses were a high impact in terms of (headache, severe headache (untreatable), vertigo / dizziness, nausea and vomiting, nausea and vomiting, sever pain, heartburn, blood clotting, breathing difficulties and arrhythmia) as indicated by low mean of scores ($M\leq 1.33$).

This findings in the same line with study that carried out by Raffaelli et al. (2017), who found that, Regarding additional diagnostic procedures, abnormal thrombocytes, GOT, GPT and CRP, proteinuria, pathologic results of lumbar puncture and neuroimaging were associated with secondary headache (Raffaelli et al.,2017). There is significant difference in impact of pregnancy induced hypertension upon pregnant women between second and third trimester. This findings in the same line with study that conducted by Hermida et al. (2008), they showed that the difference in circadian mean between these two groups is statistically significant for systolic blood pressure ($P=0.022$) but not for diastolic

blood pressure ($P=0.986$) in the second trimester. The difference in circadian mean is extremely statistically significant for both variables in the third trimester ($P<0.001$). Blood pressure disparities can be seen as early as the first trimester of pregnancy between healthy and difficult pregnancies. When both systolic and diastolic blood pressure for women with a later diagnosis of pregnant hypertension or preeclampsia are well within the established normal physiological range of blood pressure variability, those highly significant disparities are detected (Hermida et al., 2008).

Conclusion

Pregnancy induced hypertension in terms of impact, women expressed a moderate impact in two period of measurement second and third trimester (significant 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.

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