

Review Article

Effect of Various Diseases such as Hypertension and Diabetes on Delivery

Abdul Maalik¹, Sidra Saleem², Riffatullah^{3*}, Urooj Afreen¹

¹Nishtar Medical University Multan

²University College of Medicine & Dentistry Lahore

³Sheikh Zayed Medical College Rahim Yar Khan

Abstract

Hypertension and diabetes mellitus disorders are the leading cause of death and initiative of other diseases at the time of delivery or pregnancy. It can leads to maternal, neonatal or fetal morbidity or mortality in all over the world. Therefore, the study has been conducted to determine the effect of hypertension and diabetes mellitus on adverse perinatal outcomes and the study have been conducted in tertiary centers. The frequency of hypertension as well as diabetes mellitus has been explored in the study in pregnancy and its association was found with gestational age and stillbirth. **Objective:** The study was conducted to find frequency of hypertension and diabetes mellitus on pregnancy and its association with gestational age and stillbirth. **Study Design:** The population-based study was conducted for the analysis of effect of hypertension and diabetes mellitus on pregnancy and the duration of study was five months from August 2019 to December 2019. **Methodology:** A prospective population based observation study was conducted for 1st delivery. The data of almost 150 pregnant women was collected who were experiencing hypertension and diabetes mellitus at the time of pregnancy. It was also found in the study either the pregnancy and these conditions have any association or not. **Results:** It was determined in the study that pregnancy is associated with many complications from which most common are diabetes mellitus and hypertension. The result showed that the age of about 76 out of 150 pregnant women who were dealing with hypertension at the time of pregnancy and the age was range from 31-40. The study also showed that age is also linked with diabetes mellitus during pregnancy such as most of the women 76 out of 150 patients were dealing with diabetes mellitus during gestational period. **Conclusion:** It was concluded from the results that age is highly associated with various diseases especially hypertension and diabetes mellitus at the time of pregnancy. These diseases are the leading cause of other morbidities as well as mortalities for both mother and neonatal. It is important to handle the situation and take good care about these diseases especially during pregnancy.

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Introduction

Hypertensive disorder at the time of pregnancy showed complication of about 10-16% of cases and is considered as the leading cause of morbidity and mortality in young female during the age of 31-40. This age is found as critical age for pregnancy because the frequency of developing morbidity as well as mortality is high at this age in figure 1 (Diabetes and Panel, 2010). The treatment centers have revealed that there are higher risks of hypertension and other vascular disease during pregnancy and the most common cause of this problem is obesity and insulin resistance. Some other attributes that can also worsen the situation includes oxidative stress, endothelial

dysfunction and over-expression of inflammatory responses (Werner *et al.*, 2012). The leading cause of developing these diseases during pregnancy in young women is obesity because the prevalence of obesity is increasing from time and women at the age of 31-40 have high chances of developing obesity (Ishibashi *et al.*, 2011).

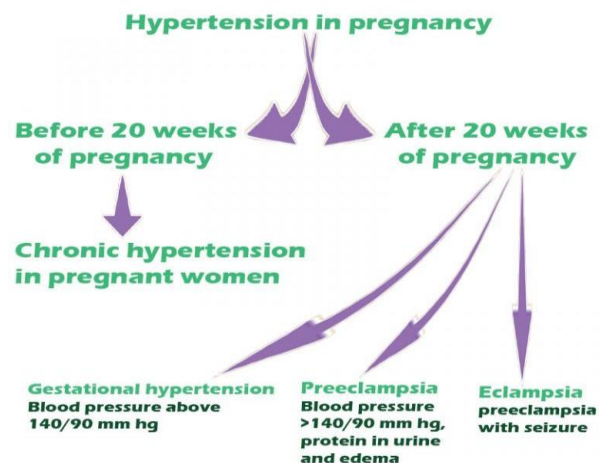


Figure 1: Hypertension in pregnancy

*Corresponding Author: Riffatullah

Address: Sheikh Zayed Medical College Rahim Yar Khan

Email address: riffatullah8@gmail.com

During pregnancy, transient insulin resistance is increased that leads to elevated postprandial glycemia as well as fasting hyperlipidemia by increase in number of triglycerides, free fatty acids, LDL particles and also accelerate ketosis (Huggins *et al.*). The pregnancy enhanced increase venous capacitance, decrease the systemic arterial resistance as well as vasodilation that cause 50% increase in circulating blood volume (Güven *et al.*, 2012). It was demonstrated in the study that high degree of postpregnancy insulin resistance, central obesity, higher body mass index, b-cell dysfunction and exaggerated hyperlipidemia has been seen in pregnant women. The research study also found that pregnancy is highly influenced on the hypertension and also worsen the situation (Ide and Farrell, 2005).

Hypertensive and diabetes disorders during pregnancy is most important problem faced by general public due to high blood pressure that is increasing the rate of morbidity and mortality of pregnant women and also normal people. The prevalence of gestational HTN, high blood pressure and preeclampsia is 1.8-4.4%, 5.2-8.2% and 0.2-9.2% respectively. Some modified risk factors of gestational blood pressure include lower education, anemia and body mass index. The non-modified risk factors of high blood pressure are maternal age, multiple pregnancy, diabetes mellitus, pre-existing hypertension, preeclampsia and pre-existing urinary tract infection. The management of high blood pressure and diabetes mellitus during pregnancy is an important step and physician should considered it while treating the pregnant women (Umesawa and Kobashi, 2017).

Objective

The study was conducted to find frequency of hypertension and diabetes mellitus on pregnancy and its association with gestational age and stillbirth.

Literature review

The rate of hypertension and diabetes mellitus is increasing in young women during pregnancy and cause of increasing this situation is still unknown. Kelly *et al.* conducted a study in 2007 to determine the prevalence of high blood pressure as well as diabetes mellitus in women of age ranges from 21-30. The prevalence of diabetes mellitus and gestational hypertension is same as prevalence of hypertension and diabetes mellitus in general people but the risk of initiating other diseases and death rate is high in pregnancy with these diseases. The author and co-authors collected papers from last 10 years to determine the prevalence and eight studies were used for the evaluating the data (Hunt and Schuller, 2007).

Sullivan *et al.* conducted a study to determine the prevalence as well as outcomes of gestational diabetes mellitus by use of new diagnostic criteria. The data was collected of almost 5,500 women were selected with 24-28 week and Atlantic Diabetes in Pregnancy screening method was used to determine the prevalence of diabetes mellitus in pregnant women. The results showed that according to WHO criteria, almost 9.4% women were diagnosed with gestational diabetes while according to IADPSG criteria, 12.4% were diagnosed with gestational diabetes mellitus. Adverse maternal outcomes such as polyhydramnios, caesarean section and gestational hypertension while neonatal outcomes such as respiratory distress,

prematurity, neonatal hypoglycemia and neonatal unit admission was also associated with the gestational diabetes mellitus (O'Sullivan *et al.*, 2011).

A study was conducted by Keenan *et al.* to determine the effect of hypertension and pre-gestational diabetes on the pregnancy. Retrospective cohort study was conducted by using the sample of almost 532,088 women in California. The women were divided into various categories such as pre-gestational diabetes, chronic hypertension and both. The results identified the differences in perinatal outcomes between various groups. The rate between both groups was 35.5% and 25.5%. Furthermore, it was concluded from the results that pre-gestational diabetes and hypertension varies within individuals and depends on the age and outcomes of pregnant women (Yanit *et al.*, 2012).

Mehta *et al.* conducted a study in 2015 to find the outcome of acute as well as chronic hypertension within different age groups. The cross-sectional study was conducted within 20 sub-centers and all women were selected who were registered as particular sub-center. Appropriate analysis method was used for the analysis of outcomes and prevalence of hypertension in pregnant women. 931 women were selected for the study and prevalence of gestational hypertension was 6.9%. The prevalence of hypertension was associated with gestational age of less than 30 years, gestational age higher than 20 weeks, history of preterm delivery, history of cesarean section and history of hypertension (Mehta, Bharti, *et al.*).

METHODOLOGY

STUDY DESIGN

Population-based observational study

SETTING

STUDY DURATION

5 Months

SAMPLING TECHNIQUE

Convenient Sampling technique

SAMPLE SIZE

150

INCLUSION CRITERIA

- Pregnant women above the age of 20 weeks
- Women of age ranges from 20 to 50 at the time of pregnancy
- Women who have diagnosed with hypertension during pregnancy
- Women who have problem of gestational diabetes
- Women belongs to both urban or rural areas

EXCLUSION CRITERIA

- Women of age older than 50 or younger than 20
- Women who are not facing the problem of hypertension or diabetes mellitus during pregnancy.
- Women with other co-morbidities

Statistical Tool

SPSS version 19

Chi-square test

ETHICAL CONSIDERATION

- Written informed consent was taken from all the patients.
- All informed and collected data will be kept confidential.
- Data will be saved in personal laptop and hard copies from data will be in locker.
- Participants will remain anonymous throughout the study
- The subject was informed there are no disadvantages or risk on the procedure of study.

- They were also informed that they are free to withdraw at any time during the process of the study

DATA COLLECTION

- All the data was collected by use of data collection sheets.
- The data was collected according to the delivery mode and age
- The demographic data was collected from all the participants.
- Demographic data was taken from the participants.

DATA ANALYSIS

Appropriate statistical data analysis technique by using SPSS version Chi-Square test was applied in statistical P-value<0.05 is analyzed.

Results

Table 1: Chronic Hypertension

		Crosstab		
		CHRONIC HTN		Total
		YES	NO	
Age	20-30	Count 21	21	42
		% of .1	.1	.3
		Total		
31-40	Count	30	46	76
	% of	.2	.3	.5
	Total			
41-50	Count	8	24	32
	% of	.1	.2	.2
	Total			
Total	Count	59	91	150
	% of	.4	.6	1.0
	Total			

The table 1 & figure 2 shows the frequency of the chronic hypertension association with age during pregnancy. The size of sample was almost 150 and the results showed that 42 out of 150 patients who were facing chronic hypertension were of 20-30 age while most of the women 76 out of 150 were dealing with hypertension during pregnancy at the age of range from 31-40. In last, age of only 32 women during pregnancy was

from 41-50 during pregnancy and was dealing with hypertension. The statistical value of chi-chart is 0.093 which is greater than 0.05 which shows that data is insignificant.

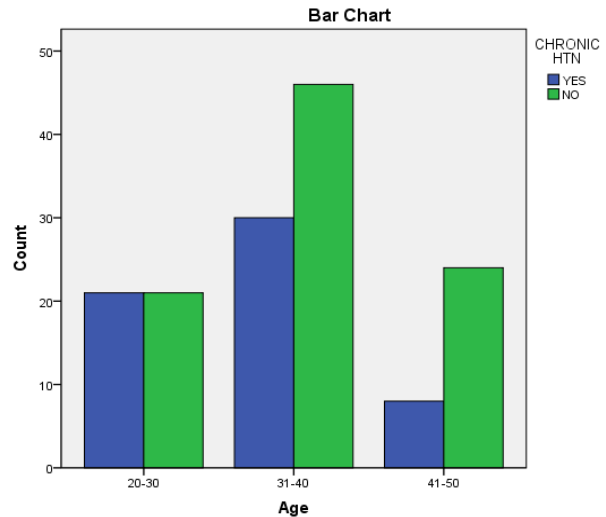


Figure 2: Chronic Hypertension

Table 2: Diabetes Mellitus

		Crosstab		
		DIABETICS MELITUS		Total
		YES	NO	
Age	20-30	Count 11	31	42
		% of .1	.2	.3
		Total		
31-40	Count	18	58	76
	% of	.1	.4	.5
	Total			
41-50	Count	7	25	32
	% of	.0	.2	.2
	Total			
Total	Count	36	114	150
	% of	.2	.8	1.0
	Total			

The table 2 & figure 3 showed the frequency of diabetes mellitus during pregnancy such as the age of 42 out of 150 women was 21-30 who were dealing with diabetes mellitus during pregnancy but the age of mostly women as 76 was 31-50 while only 32 out of 150 women were between 41-50. The statistical value of chi-square is 0.908, which is greater than 0.05, which shows that data is insignificant.

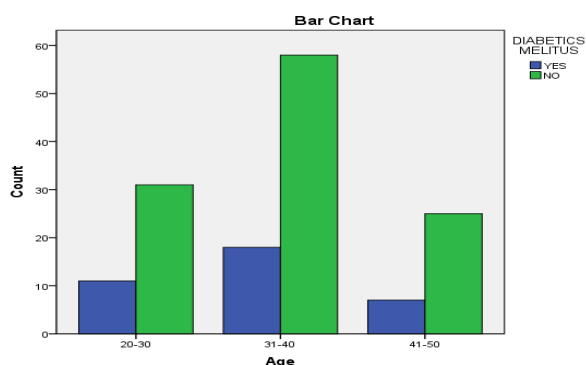


Figure 3: Diabetes Mellitus

Table 3: Gestation Diabetes Mellitus

		GESTATIONAL DM		Total	
		YES	NO		
Age	20-30	Count	13	29	42
		% of Total	.1	.2	.3
	31-40	Count	23	53	76
	% of Total	.2	.4	.5	
41-50	Count	10	22	32	
	% of Total	.1	.1	.2	
	Total	Count	46	104	150
	% of Total	.3	.7	1.0	

The table 3 & figure 4 showed the frequency of gestational diabetes mellitus during pregnancy such as the age of 42 out of 150 women was 21-30 who were dealing with gestational diabetes mellitus during pregnancy but the age of mostly women as 76 was 31-50 while only 32 out of 150 women were from 41-50. The statistical value of chi-square is 0.994, which is greater than 0.05, which shows that data is insignificant.

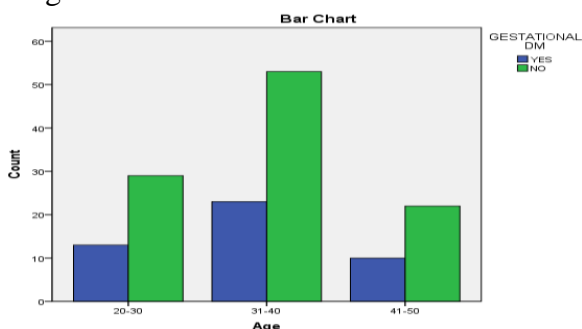


Figure 4: Gestation Diabetes Mellitus

Discussion

The results showed that prevalence and outcomes of gestational chronic hypertension. The size of sample was almost 150 and the results showed that 42 out of 150 patients who were facing chronic hypertension were of 20-30 age while most of the women 76 out of 150 were dealing with hypertension during pregnancy at the age of range from 31-40. The result was similar to the study conducted by Mehta et al. who determine the prevalence and outcomes of acute and chronic hypertension in pregnant women. It was determined from the study that the prevalence of hypertension was associated with gestational age of less than 30 years, gestational age higher than 20 weeks, history of preterm delivery, history of cesarean section and history of hypertension. The results were also similar to the study conducted by Keenan et al. who found that pregestational diabetes and hypertension varies within individuals and depends on the age and outcomes of pregnant women.

The results showed that the rate of gestational diabetes mellitus is higher as compare to diabetes mellitus in general public and the frequency of co-morbidities and mortality is also higher in pregnant women. The result were similar to a study conducted by Kelly et al. in which it was found that the prevalence of diabetes mellitus and gestational hypertension is same as prevalence of hypertension and diabetes mellitus in general people but the risk of initiating other diseases and death rate is high in pregnancy with these diseases. The results were also similar to the study conducted by Keenan et al. who determine the rate of diabetes mellitus and

hypertension in pregnant women and it was found in the study that the rate of both these diseases was 35.5% and 25.5% respectively.

Conclusion

It was concluded from the results that age is highly associated with various diseases especially hypertension and diabetes mellitus at the time of pregnancy. These diseases are the leading cause of other morbidities as well as mortalities for both mother and neonatal. It is important to handle the situation and take good care about these diseases especially during pregnancy. The result of chi-square tests are higher than 0.05 which shows that the results found from the study are unsatisfactory and needs some amendments.

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