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Original article

Prevalence of Diabetes and Hypertension among Pregnant Women Attending Medical Laboratories in Zawia City, Libya

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Abstract
This study aimed to identify and evaluate the prevalence of diabetes and blood pressure among a sample of 230 pregnant women, classified according to the number of pregnancies and different age groups, in the city of Zawiya, western Libya, from January 2025 to March of the same year. The study reached several findings, including the prevalence of diabetes and high blood pressure among a group of pregnant women by age group and the number of pregnancies per woman. The age group from (24-29) recorded the highest rate of diabetes, reaching 13.48%, followed by the age group from (18-23), and the age group from (30-35) with 7.39% for both, while the age group from (36-41) recorded the lowest rate of diabetes, reaching 5.65% As well as the rate of high blood pressure in women, the highest percentage was recorded in the age group (24-29) at 7.82%, followed by the age group (30-35) at 7.34% of the total cases, and the age group (36-41) recorded the lowest percentage at 5.22%. This is consistent with many studies that have addressed the subject in different regions of the world. In addition to the number of pregnancies in women, the highest rate of diabetes and high blood pressure was recorded in the first pregnancy at 10.43% of the number of pregnancies among pregnant women. The rate of diabetes and high blood pressure by age group for all pregnant women in the study sample was recorded at 35.21% and 27.82%, while the rate of diabetes due to the number of pregnancies among all pregnant women was 40.87%, and the rate of high blood pressure was recorded at 33.91% among the study sample. The incidence of diabetes and high blood pressure varied among pregnant women, and the number of pregnancies varied in terms of rates. This may be due to many other variables that affect the incidence of diabetes and high blood pressure during pregnancy, the number of pregnancies, and other factors. The study recommended conducting various scientific studies and research that address this aspect of the lives of pregnant women who need great care and attention, including early screening Periodic follow-up of cases, and provision of high-precision health and therapeutic services to enhance the health of pregnant women
Keywords. Diabetes, Blood Pressure, Pregnant Women, Medical Laboratories, Zawiya.

Introduction

During the different stages of pregnancy, pregnant women experience many metabolic changes and haematological and biochemical indicators [1,2]. The results of many studies have shown a link between diabetes levels, blood pressure, gestational diabetes, and changes in lipid levels, including total cholesterol, low-density lipoprotein, triglycerides, and atherosclerosis, as well as an increased risk of cardiovascular diseases [3]. It has health repercussions on the mother and fetus, and there is much evidence that confirms that pregnancy complications are linked to health problems for the mother even after the end of pregnancy, especially type 2 diabetes and chronic high blood pressure [4].

Pregnancy has become a burden and a physiological stress test due to the pressure it causes on a woman's body, which may reveal many hidden predispositions and preparations for contracting chronic diseases that remain hidden for several years before contracting them [5]. Despite the existence of many data related to the risks of pregnancy complications in pregnant women, such as gestational hypertension, pregnancy toxicity, gestational diabetes, spontaneous premature birth, placental abruption, miscarriage, stillbirth, atherosclerosis, cardiovascular diseases, venous thromboembolism, excessive obesity, high body mass index, and cancer Thyroid, stomach, and mental health disorders such as depression and anxiety, despite the many evidence reached by various studies that there is a link between pregnancy complications and the risks that are exposed during the pregnancy period [6,7].

Health care providers in many countries that lack a high-quality health system and third world countries that have little full awareness about the risks of pregnancy complications to which pregnant women and the fetus are exposed, which necessitates taking many strict preventive measures to monitor pregnancies and conduct Periodic examination to assess the risks to which women are exposed in the short and long term to maintain the health of the mother and child [8]. The results of these studies and scientific reports have shown that women with diabetes are at increased risk of developing pregnancy complications such as congenital malformations, preeclampsia, and premature birth [9,10], especially if it coincides with chronic high blood pressure in the perinatal period. The aim of the study was to identify the prevalence of diabetes and high blood pressure among a sample of pregnant women according to the number of pregnancies in Zawia City in northwestern Libya.

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Methods

The study was conducted on a random sample of 230 pregnant women who visit laboratories and medical clinics in the city to conduct some periodic and routine examinations necessary to monitor their health condition during the various stages of pregnancy, in the period extending from January 2025 to March 2025. Data related to the study were recorded in a form prepared in advance by the researchers containing the level of blood pressure, diabetes, and age groups for all members of the sample. The sample was divided into two groups of 115 cases each, according to the number and percentage of blood pressure, and the percentage and number of diabetes cases according to the number of pregnancies, the first to fifth pregnancy for women in the study sample.

Results

Tracking the data recorded in Table 1, which represents the number and percentage of pregnant women's cases according to diabetes and blood pressure, and their distribution among different age groups. We find that the age group (24-29) recorded the highest percentage of cases, reaching 13.48%, who had high blood sugar, while 3.48% had normal blood sugar. On the other hand, cases in the same age group recorded 7.82% of high blood pressure cases, and 5.22% of cases had normal blood pressure. Followed by the age group (18-23), the age group (30-35), with 17 cases of women each, where 7.39% of women suffer from high diabetes, and 5.22% have a normal diabetes level, while the age group (30-35) recorded 3.48% of cases with diabetes and normal diabetes, while the percentage of cases with high blood pressure reached 7.39%, and 7.39% For the two age groups, respectively, 3.91% and 7.39% of cases had normal blood pressure.

Finally, in the age group (36-41), the percentage of women suffering from high diabetes reached 5.65%, and 2.61% of cases had a normal diabetes level. As for the high blood pressure level, the percentage of cases reached 5.22%, and 8.26% had a normal blood pressure level. This confirms the existence of variation in the prevalence and distribution of high blood pressure and diabetes among cases according to their different age groups. The incidence of diabetes for all sample members according to the different age groups of pregnant women reached 35.2%, while the incidence of high blood pressure reached only 27.82%.

Table 1. Number and percentage of sample members according to blood pressure, diabetes, and age range.

Age group	Diabetes				Blood pressure			
	High		normal		High		Normal	
	number	%	number	%	number	%	number	%
18-23	20	8.69	12	5.22	17	7.39	9	3.91
24-29	31	13.48	8	3.48	18	7.82	12	5.22
30-35	17	7.39	8	3.48	17	7.39	14	6.08
36-41	13	5.65	6	2.61	12	5.22	16	8.26
Total	81	35.21	34	14.78	64	27.82	51	22.17
	115				115			

By presenting the data recorded in Table 2 for the number and percentage of pregnant women according to the level of diabetes and the number of pregnancies, we find that the total number of cases among registered women was 115 cases out of the total study sample, which was (230) cases. In this study (31) cases were recorded, representing 13.48%, with their first pregnancy; the number of people with diabetes reached (24) cases, representing 10.43%, and (7) cases were recorded, representing 3.04%, with normal diabetes.

While (23) cases, representing 10%, were recorded in the second stage of pregnancy, the number of women suffering from diabetes reached (17) cases, representing 7.39%, and (6) cases, representing 2.61%, had a normal diabetes level.

In the third pregnancy, the number of women reached (18) cases, representing 7.82%, all of whom suffered from a high level of diabetes, as for the fourth stage of pregnancy, (25) cases of women were recorded, representing 10.87%. The number of women with diabetes was (19) cases, representing 8.26%, with a high level of diabetes The number of normal cases reached (6), representing 2.61%, while the fifth stage of pregnancy was (18) cases, representing 7.82%, and the diabetes level was high for (16) cases, representing 6.96%, and (2) cases, representing 0.%87, had diabetes at the normal level.

From the above, it is clear that the majority of pregnant women, indeed most of them, suffer from high levels of diabetes during any case of pregnancy, from the first to the fifth, We note that the percentage of pregnant women with diabetes, depending on the number of pregnancies, reached 40.87% of the total sample members.

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Table 2. Percentage and number of pregnant women according to diabetes level and number of pregnancies

Number of pregnancies	Number	%	Level of diabetes			
			High		Normal	
			Number	%	Number	%
First	31	13.48	24	10.43	7	3.04
Second	23	10	17	7.39	6	2.61
Third	18	7.82	18	7.82	-	-
Fourth	25	10.87	19	8.26	6	2.61
Fifth	18	7.82	16	6.96	2	0.87
Total	115	50	94	40.87	21	9.13

As for the data related to the number and percentage of pregnant women according to the level of blood pressure and the number of pregnancies, as shown in (Table 3), the largest number was recorded in the first pregnancy with (29) cases, representing 12.61%. The number of women suffering from high blood pressure reached (24) cases, representing 10.43% There are (5) women, representing 2.17%, who have a normal blood pressure level , Followed by the fourth pregnancy case with (25) cases, which accounted for 10.87%, and after (13) cases with high blood pressure, representing 5.65% There are (12) cases of women, 5.22% of whom have normal blood pressure levels, It was followed by the third stage of pregnancy with (24) cases of women, representing 10.43%. The number of cases of high blood pressure reached (15) cases, representing 6.52%. Then the second stage, with (19) cases, represented 8.26%. The number of cases of high blood pressure among pregnant women was recorded at (15) cases, representing 6.52%. Finally, the fifth pregnancy case, which was recorded with (18) cases, representing 7.83% High blood pressure cases reached (11) cases, representing 4.78%, There are (7) women, 3.04% of whom have normal blood pressure, It is clear from the above that pregnant women are exposed to high blood pressure during different pregnancies, whether it is the first or fifth pregnancy. While the percentage of women with high blood pressure according to the number of different pregnancies reached 33.91% of the total study sample.

Table 3. Percentage and number of pregnant women according to blood pressure level and number of pregnancies

Pregnancy phase	Number	%	Level of pressure			
			High		Normal	
			number	%	number	%
First	29	12.61	24	10.43	5	2.17
Second	19	8.26	15	6.52	4	1.74
Third	24	10.43	15	6.52	9	3.91
Fourth	25	10.87	13	5.65	12	5.22
Fifth	18	7.83	11	4.78	7	3.04
Total	115	50	78	33.91	37	16.08

Discussion

Through the results reached by the study, it became clear that the prevalence of diabetes and gestational blood pressure among pregnant women during the different stages of pregnancy varies according to age groups and the number of pregnancies among pregnant women, and this is consistent with many studies [5]. As the highest percentage was recorded in the age group from 24 to 29 years, estimated at 13.48%, followed by the age group N (18-23 years) and (30-35 years) by 7.39% for both, respectively, and the lowest percentage was recorded in the age group (36-41 years) by 5.65%, as confirmed by the study [11]. while the prevalence of diabetes was 7.82% among pregnant women in the same age group (24-35 Y), followed by the age group of (30-35 Y) by 7.34%, and by 7.39% in the age group of (18-23), The percentage in the age group from 36 to 41 years reached about 5.22%, which is the lowest rate compared to the rest of the age groups, which is consistent with the study [12]. The incidence of diabetes for all pregnant women according to different age groups reached 35.21%, while the incidence of high blood pressure was 27.82% of the total study sample.

The results of which confirmed an increase in the rates of high blood pressure and diabetes by 44%. In pregnant women between the ages of 15 and 29, it decreases when compared to women between the ages of 40 and 41 as they get older. He also confirmed that there is a link between the prevalence of high blood pressure and diabetes among pregnant women, especially with some of the financial pressures that pregnant women go through during the different stages and periods of pregnancy. This confirms that many factors may contribute to increasing the rates of high blood pressure and diabetes among pregnant women in the different stages and periods of pregnancy. The highest rate of pregnancies with high blood pressure and

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diabetes was recorded in the first pregnancy among women, with 24 cases each of high blood pressure and diabetes, representing 10.43% for both, followed by the fourth pregnancy with 13 cases of high blood pressure, representing 5.65%, and 19 cases of high diabetes, representing 8.26%.
It is followed by the third pregnancy, with 15 cases, representing 6.52% of those with high blood pressure, and 18 cases, representing 7.82% of those with high diabetes. As for the second pregnancy, 15 cases had high blood pressure, representing 5.65%, and 17 cases, representing 7.39%, had high diabetes. The fifth case involved 11 women, of whom 4.78% had high blood pressure, and 16 cases, representing 6.96%, had high diabetes; this finding is consistent with the study by [13]. and another study by [14], which confirmed the link between high blood pressure and diabetes in pregnant women. There is an existence of a link between high blood pressure and diabetes in pregnant women, in addition to some accompanying diseases, especially with weight gain [6].and chronic diseases such as kidney disease, in which the risk may reach 1.42 with a confidence level of 95% [15].and some of them recommended conducting early clinical examinations to improve prevention and provide therapeutic health services to enhance the health of pregnant women and children, especially after childbirth. Diabetes and high blood pressure may contribute to pregnant mothers contracting multiple diseases that cause the death of fetuses and newborns, as deaths in the United States have reached 10-15% of all pregnant women [13]. The results showed that women with diabetes have higher blood pressure levels and more risk factors for type 2 diabetes compared to those with normal blood pressure, which is consistent with [16]. According to the study's findings, the incidence of diabetes among pregnant women, according to the number of different pregnancies, was 40.87%, while the incidence of high blood pressure among women, according to the number of pregnancies, was 31.91%, among the study sample.

Conclusion

We conclude from the results of the study that pregnant women are at risk of developing diabetes and high blood pressure. It turned out that the cases of infection were multiple and varied according to the number of pregnancies and different groups. The highest percentage was for the age groups (24-29) and (18-23), compared to the older groups. The incidence of diabetes for pregnant women by age group reached 35.21%, and the incidence of high blood pressure reached 27.82%, while the incidence of diabetes and high blood pressure by number of pregnancies reached 40.87% and 33.91%, respectively. There is an urgent need to conduct various research and studies on this aspect that affects women's lives and threatens their health and the health of fetuses and newborns, which represents the health of future generations.

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Conflicts of Interest
The authors declare no conflicts of interest.

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