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Most frequent problems of pregnant women with gestational diabetes mellitus

Abstract

Introduction. Gestational diabetes mellitus (GDM) is the most common metabolic disorder happening to pregnant women. Some 3-5% of all pregnant women in Poland are diagnosed with the condition. Glucose tolerance disorders or gestational diabetes recur in about 30% of women during their second (or next) pregnancy. Controlling diabetes involves many new responsibilities and sacrifices that may be difficult to bear for a pregnant woman.

Aim. The aim of the present study was to examine the most common problems among pregnant women with gestational diabetes

Material and methods. The study was conducted between 2015 and 2016. The authors used a diagnostic survey on 120 pregnant women with diabetes who were patients in gestational pathology and conservative gynecological treatment departments and diabetic outpatient clinics in Lublin. The χ^2 test of independence was used to examine correlations between socio-demographic factors and problems experienced by pregnant women with gestational diabetes.

Results. Problems with keeping a blood glucose monitoring diary were reported by women from cities different than province capitals (75%). Childless women reported problems with pricking their finger multiple times a day (60%). Insulin injections were perceived as a GDM-related problem mostly by women aged 31-35 (41.2%), women in their second pregnancy (61.8%) and women with more than one child (47.1%). Frequent visits to the doctor were perceived as a problem mostly by women aged less than 26 (42.3%), women living in rural areas (57.7%), women with higher education (84.6%), women in their first pregnancy (61.5%) and women without children (73.1%). The two last groups additionally indicated psychological burden (84.2% and 78.9%, respectively). Anxiety about the occurrence of type 2 diabetes was mainly expressed by women aged 26-30 (35.3%) and those in their second pregnancy (52.9%), whilst working women expressed concern for their own lives (78.6%).

Conclusions. There is a correlation between selected problems experienced by pregnant women with GDM and socio-demographic variables such as: age, place of residence, education, professional activity and number of pregnancies and children. The results obtained suggest that there is a need for educating women about the most frequent problems that accompany pregnancy with GDM.

Keywords: gestational diabetes, pregnant women, problems.

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INTRODUCTION

Gestational diabetes mellitus (GDM) is the most common metabolic disorder happening to pregnant women. Some 35% of all pregnant women are diagnosed with it. Problems with glucose tolerance recur in about 30% of women during their second (or next) pregnancy. In recent years, an increased prevalence of gestational diabetes has been observed worldwide [1,2].

The guidelines issued by the Polish Diabetes Association regarding comprehensive care over pregnant women with GDM indicate that proper medical care combined with nutritional therapy may yield positive results for both the mother and her child. Raising awareness among women in the reproductive period through early diagnoses of carbohydrate tolerance disorder and preventive initiatives are very important for preventing complications during pregnancy [1,3].

Controlling diabetes during pregnancy creates a number of new responsibilities and involves many sacrifices on the part

of the patient. The risk of complications that pose a threat to the health of both the mother and the child may also negatively impact the woman's mental health [4].

AIM

The aim of the present study was to examine the most common problems among pregnant women with gestational diabetes.

MATERIAL AND METHODS

The study was conducted using a diagnostic survey in years 2015-2016 among pregnant women who were patients in gestational pathology and conservative gynaecological treatment departments and diabetic outpatient clinics in Lublin. Participation in the study was voluntary and anonymous. The study was approved by the Bioethics Committee of the Medical University of Lublin (KE-0254/75/2016).

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A survey questionnaire developed by the authors was used as a research tool in the study. The survey was designed for pregnant women previously diagnosed with gestational diabetes mellitus. Participation in the study was anonymous. Data obtained from 120 questionnaires was analysed using computational statistics. Statistical analysis was performed in SPSS

Statistics 23.0 for Windows. The χ^2 test of independence was used to examine correlations between socio-demographic factors and problems experienced by pregnant women with gestational diabetes. The significance threshold was set at $p < 0.05$.

RESULTS

TABLE 1. Description of the study group.

Socio-demographic data		N	%
Marital status	Single	17	14.2
	Married	103	85.8
Age	<25	26	21.7
	26-30	36	30
	31-35	40	33.3
	>36	18	15
Place of residence	Capital of a province	45	37.5
	Other type of city	44	36.7
	Rural areas	31	25.8
Education	Secondary and lower	47	39.2
	Higher	73	60.8
Professional activity	Professionally active	62	51.7
	Not professionally active	58	48.3
Number of past pregnancies	First pregnancy	52	43.3
	Second pregnancy	52	43.3
	Third or next pregnancy	16	13.3
Number of children	No children	63	52.5
	One child	44	36.7
	Two or more children	13	10.8

Most of the women surveyed were married (85.5%). The participants were aged 31-35 (33.3%) and 26-30 (30.0%), lived in cities (74.2%), had higher education (60.8%), worked (51.7%), did not have children (52.5%), were in their first (43.3%) or second (43.3%) pregnancy – Table 1.

In order to identify the greatest challenges that women with gestational diabetes have to face, they were asked to select three problems they found the most difficult to bear. The most frequent ones included: fear of losing the baby and anxiety over the health of the child (86.7%), the need for capillary sampling multiple times during the day (45.8%), the necessity of performing insulin injections (28.3%), anxiety about future occurrence of type 2 diabetes (28.3%), the necessity to change dietary habits (26.6%), frequent visits to the doctor (21.6%) – Table 2.

The statistical analysis conducted has revealed significant correlations between age, place of residence ($p < 0.05$) and selected problems of pregnant women with gestational diabetes (Table 2). No such relationship was found for marital status ($p > 0.05$).

Problems with keeping a blood glucose monitoring diary were reported more often by women from cities other than province capitals (75.9%, $p < 0.05$). The necessity of frequent visits to the doctor was a huge obstacle for residents of rural areas (57.7%, $p < 0.01$). The respondents under 26 years of age also perceived frequent appointments as the key problem

TABLE 2. Correlation between problems of women with gestational diabetes and their marital status, age and place of residence.

Problems related to gestational diabetes	Total %	Marital status		Statistical analysis	Age				Statistical analysis	Place of residence			Statistical analysis
		Single %	Married %		<26 %	26-30 %	31-35 %	>35 %		Capital of a province %	Other type of city %	Rural areas %	
Mother's concern for the health and life of her child	86.7	13.5	86.5	$\chi^2=0.32$ $p>0.05$	20.2	29.8	34.6	15.4	$\chi^2=1.25$ $p>0.05$	23.1	36.5	40.4	$\chi^2=4.03$ $p>0.05$
Pricking the finger tip multiple times a day	45.8	18.2	81.8	$\chi^2=1.35$ $p>0.05$	30.9	25.5	30.9	12.7	$\chi^2=5.23$ $p>0.05$	29.1	29.1	41.8	$\chi^2=2.51$ $p>0.05$
Insulin injections	28.3	5.9	94.1	$\chi^2=2.68$ $p>0.05$	2.9	29.4	41.2	26.5	$\chi^2=12.72$ $p<0.01$	20.6	44.1	35.3	$\chi^2=1.29$ $p>0.05$
Anxiety about possible occurrence of type 2 diabetes	28.3	11.8	88.2	$\chi^2=0.23$ $p>0.05$	5.9	35.3	29.4	29.4	$\chi^2=12.69$ $p<0.01$	29.4	38.2	32.4	$\chi^2=0.60$ $p>0.05$
Need to change dietary habits	26.7	15.6	84.4	$\chi^2=0.08$ $p>0.05$	28.1	25.0	43.8	3.1	$\chi^2=6.73$ $p>0.05$	28.1	43.8	28.1	$\chi^2=1.71$ $p>0.05$
Frequent doctor's visits	21.7	19.2	80.8	$\chi^2=0.70$ $p>0.05$	42.3	23.1	30.8	3.8	$\chi^2=9.88$ $p<0.05$	3.8	38.5	57.7	$\chi^2=9.85$ $p<0.01$
Anxiety about delivering a large child	17.5	14.3	85.7	$\chi^2=0.00$ $p>0.05$	23.8	38.1	28.6	9.5	$\chi^2=1.29$ $p>0.05$	28.6	28.6	42.9	$\chi^2=0.72$ $p>0.05$
Psychological burden	15.8	15.8	84.2	$\chi^2=0.05$ $p>0.05$	26.3	36.8	21.1	15.8	$\chi^2=1.61$ $p>0.05$	42.1	31.6	26.3	$\chi^2=3.23$ $p>0.05$
Mother's concern for her own life and health	11.7	21.4	78.6	$\chi^2=0.69$ $p>0.05$	21.4	14.3	35.7	28.6	$\chi^2=3.28$ $p>0.05$	35.7	28.6	35.7	$\chi^2=0.90$ $p>0.05$
Keeping a blood glucose monitoring diary	6.7	0.0	100.0	$\chi^2=1.41$ $p>0.05$	12.5	12.5	62.5	12.5	$\chi^2=3.43$ $p>0.05$	0.0	75.0	25.0	$\chi^2=6.01$ $p<0.05$
Treatment-related expenses	1.7	0.0	100.0	$\chi^2=0.34$ $p>0.05$	0.0	50.0	50.0	0.0	$\chi^2=1.19$ $p>0.05$	100.0	0.0	0.0	$\chi^2=5.84$ $p>0.05$

(42.3%, $p < 0.05$), while women aged 26-30 (35.3%) were mostly concerned about type 2 diabetes occurring in the future ($p < 0.01$). Performing insulin injections ($p < 0.01$) was the greatest challenge for participants aged 31-35 (41.2%).

The statistical analysis has revealed significant correlations ($p < 0.05$) between education, professional activity and selected problems of women with gestational diabetes. The necessity to visit the doctor frequently was the greatest problem for women

with higher education (84.6%, $p < 0.01$). Working women were concerned about their lives and health (78.6%, $p < 0.05$) – Table 3.

The statistical analysis demonstrated a significant correlation between the selected problems experienced by pregnant women with GDM and their maternal experience, i.e. number of past pregnancies and number of children (Table 4). Insulin injections were the greatest problem for the respondents in the second pregnancy (61.8%, $p < 0.001$), and those who had

TABLE 3. Correlation between problems of women with gestational diabetes and their education and professional activity.

Problems related to gestational diabetes	Total %	Education		Statistical analysis	Professional activity		Statistical analysis
		Secondary and lower %	Higher %		Professionally active	Not professionally active	
Mother's concern for the health and life of her child	86.7	37.5	62.5	$\chi^2=0.91$ $p > 0.05$	49.0	51.0	$\chi^2=0.16$ $p > 0.05$
Pricking the finger tip multiple times a day	45.8	38.2	61.8	$\chi^2=0.04$ $p > 0.05$	45.5	54.5	$\chi^2=0.34$ $p > 0.05$
Insulin injections	28.3	38.2	61.8	$\chi^2=0.02$ $p > 0.05$	47.1	52.9	$\chi^2=0.03$ $p > 0.05$
Anxiety about possible occurrence of type 2 diabetes	28.3	47.1	52.9	$\chi^2=1.24$ $p > 0.05$	50.0	50.0	$\chi^2=0.05$ $p > 0.05$
Need to change dietary habits	26.7	46.9	53.1	$\chi^2=1.09$ $p > 0.05$	46.9	53.1	$\chi^2=0.04$ $p > 0.05$
Frequent doctor's visits	21.7	15.4	84.6	$\chi^2=7.88$ $p < 0.01$	46.2	53.8	$\chi^2=0.06$ $p > 0.05$
Anxiety about delivering a large child	17.5	38.1	61.9	$\chi^2=0.01$ $p > 0.05$	38.1	61.9	$\chi^2=1.07$ $p > 0.05$
Psychological burden	15.8	52.6	47.4	$\chi^2=1.72$ $p > 0.05$	47.4	52.6	$\chi^2=0.01$ $p > 0.05$
Mother's concern for her own life and health	11.7	50.0	50.0	$\chi^2=0.78$ $p > 0.05$	78.6	21.4	$\chi^2=5.80$ $p < 0.05$
Keeping a blood glucose monitoring diary	6.7	12.5	87.5	$\chi^2=2.56$ $p > 0.05$	25.0	75.0	$\chi^2=1.87$ $p > 0.05$
Treatment-related expenses	1.7	100.0	0.0	$\chi^2=3.16$ $p > 0.05$	100.0	0.0	$\chi^2=2.17$ $p > 0.05$

TABLE 4. Correlation between problems of women with gestational diabetes and their maternal experience.

Problems related to gestational diabetes	Total %	Number of past pregnancies			Statistical analysis	Number of children			Statistical analysis
		First pregnancy	Second pregnancy	Third or next pregnancy		No children	One child	Two or more children	
Mother's concern for the health and life of her child	86.7	41.3	43.3	15.4	$\chi^2=3.17$ $p > 0.05$	51.9	35.6	12.5	$\chi^2=2.30$ $p > 0.05$
Pricking the finger tip multiple times a day	45.8	50.9	41.8	7.3	$\chi^2=4.20$ $p > 0.05$	60.0	36.4	3.6	$\chi^2=5.95$ $p < 0.05$
Insulin injections	28.3	11.8	61.8	26.5	$\chi^2=20.77$ $p < 0.001$	26.5	47.1	26.5	$\chi^2=18.23$ $p < 0.001$
Anxiety about possible occurrence of type 2 diabetes	28.3	26.5	52.9	20.6	$\chi^2=6.00$ $p < 0.05$	38.2	44.1	17.6	$\chi^2=4.59$ $p > 0.05$
Need to change dietary habits	26.7	53.1	37.5	9.4	$\chi^2=1.82$ $p > 0.05$	62.5	31.3	6.3	$\chi^2=2.03$ $p > 0.05$
Frequent doctor's visits	21.7	61.5	38.5	0.0	$\chi^2=7.15$ $p < 0.05$	73.1	26.9	0.0	$\chi^2=7.13$ $p < 0.05$
Anxiety about delivering a large child	17.5	42.9	47.6	9.5	$\chi^2=0.39$ $p > 0.05$	42.9	47.6	9.5	$\chi^2=1.32$ $p > 0.05$
Psychological burden	15.8	84.2	0.0	15.8	$\chi^2=18.59$ $p < 0.001$	78.9	10.5	10.5	$\chi^2=7.22$ $p < 0.05$
Mother's concern for her own life and health	11.7	57.1	21.4	21.4	$\chi^2=3.23$ $p > 0.05$	64.3	14.3	21.4	$\chi^2=4.23$ $p > 0.05$
Keeping a blood glucose monitoring diary	6.7	37.5	62.5	0.0	$\chi^2=1.94$ $p > 0.05$	50.0	50.0	0.0	$\chi^2=1.35$ $p > 0.05$
Treatment-related expenses	1.7	0.0	100.0	0.0	$\chi^2=2.66$ $p > 0.05$	0.0	100.0	0.0	$\chi^2=3.51$ $p > 0.05$

more than one child (47.1%, $p < 0.001$). For women in their first pregnancy the most arduous factors were frequent doctor's visits (61.5%, $p < 0.05$) and huge psychological burden caused by the disease (84.2%, $p < 0.05$). Women in their second pregnancy reported anxiety about type 2 diabetes (52.9%), ($p < 0.05$). The greatest challenges for childless women were: daily capillary sampling (60.0%, $p < 0.05$), frequent visits to the doctor (73.1%, $p < 0.05$) and huge psychological burden caused by the disease (78.9%, $p < 0.05$).

DISCUSSION

According to the classification provided by the World Health Organization, gestational diabetes, together with type 1 and type 2 diabetes, is one of the most frequent carbohydrate metabolism disorders in pregnancy. Epidemiological data on the global prevalence of gestational diabetes indicates that 3%-20% of all pregnant women suffer from the disease [5].

Controlling diabetes in pregnancy creates a number of responsibilities and involves great sacrifices on the part of the patient. The risk of complications that pose a threat to the health of both the mother and the child may negatively impact the woman's mental health [4]. This has been confirmed in the research studies by the authors, which shows that patients are most often concerned about their life and health. Consequently, the disease is a psychological burden for the study participants.

The available subject literature contains a rather limited number of studies on GDM-induced problems [1,4]. The present study attempts to identify problems of women with GDM depending on socio-demographic variables to identify the groups of patients most vulnerable to such difficulties.

The results obtained are slightly different from those reported by other authors in studies on the same subject. Majda et al. [4] scored problems caused by GDM on a scale from 0 to 8, where 0 corresponded to the strongest and 8 to the weakest impact on the patients' quality of life. Diabetic complications that may affect the child's health and survival received the highest scores (mean 3.32 points). Similar results were obtained in the present study, as almost all participants reported anxiety over their baby's survival and health (86%). Another important factor was the need to change dietary habits (mean 3.6 points). This did not correspond with the results of the present study where changing dietary habits was considered a significant problem by only one fourth of the participants (26.6%).

Regarding the need to prick the finger tip for blood sugar testing and administer insulin injections multiple times a day, both studies yielded similar results (mean 3.87). Over two fifths of the respondents in the present study indicated that finger pricking was a problem for them (45.8%) and over one fourth (28.3%) perceived the need to perform insulin injections as a difficulty. Pricking the finger tip several times a day was mostly a problem for married women (94.1%) and women with higher education (61.8%). Insulin injections were perceived as a GDM-related problem mostly by women aged 31-35 (41.2%), women in their second pregnancy (61.8%) and women that already had one child (47.1%).

In both studies, keeping a blood glucose monitoring diary (6.7%; 5.8 pts) and estimated costs of treatment (1.7%; 4.9 pts) were perceived as the least serious problems. Keeping a blood glucose monitoring diary was most difficult for women living in cities other than province capitals (75.0%) and unemployed women (75.0%).

Different results may be found in the study by Kutowska et al. [6]. Here, the most significant difficulty for pregnant women treated with nutritional therapy or nutritional therapy combined with insulin administration was proper meal planning and maintaining balanced diet. It is also surprising that negative assessment of the quality of life was only slightly higher in women treated with insulin injections.

The results concerning psychological burden of the disease were similar in the present study and the study by Kutowska et al. [6]. It was demonstrated that having been diagnosed with gestational diabetes decreased the sense of security among nearly a half of the women participating in the study (49%) and therefore had a significant impact on their mental health.

The study by Kalka [7] also demonstrated that symptoms of depression were more intense among diabetic patients, as compared to the healthy population. At the same time, patients experiencing heavy psychological burden find it more difficult to maintain an appropriate diet and engage in physical activity, which facilitates maintaining normal blood glucose level. GDM-induced psychological burden was a problem for one sixth of the participants in the present study (15.8%). The two groups which struggled the most with the psychological burden caused by the disease were women in their first pregnancy and childless women (84.2% and 78.9% respectively).

The results of the study by Morylowska-Topolska et al. [8] on psychological burden experienced by women in the first trimester of pregnancy are consistent with the results of the present study. Women in their first pregnancy had higher scores on the anxiety scale. A similar pattern was noticed in a study by Lee et al. [9].

The present study has also demonstrated a correlation between socio-demographic factors and the frequency of visits to the doctor. The groups which perceived frequent appointments as a difficulty were: women aged less than 26 (42.3%), women living in rural areas (57.7%), women with higher education (84.6%), women in their first pregnancy (61.5%) and women without any maternal experience (73.1%).

First diagnosis of carbohydrate tolerance disorder during pregnancy has an adverse impact on its course and poses a risk of complications after delivery for both the mother and the child. Pregnancy with GDM increases the risk of type 2 diabetes, obesity, metabolic disorders and cardio-vascular diseases both in mothers and their children [2, 10]. In the present study, anxiety over the occurrence of type 2 diabetes was expressed primarily by women aged 26-30 (35.3%) and those in their second pregnancy (52.9%), whereas concern for one's life was mostly expressed by working women (78.6%).

In conclusion, gestational diabetes involves a number of problems which may influence the course of pregnancy. Gestational diabetes is associated with the necessity of changing one's lifestyle, numerous limitations for the patient and may have a considerable impact on women's mental health and quality of life [11]. Chudiak et al. [12] and the guidelines issued by the Polish Gynecological Society [13] point to the positive effect of health education on both physical and mental functioning. The results of the present study suggest that there is a need to provide education to high-risk women in order to mitigate the negative effects of GDM, both physical and mental.

CONCLUSIONS

1. There is a correlation between particular problems experienced by pregnant women with gestational diabetes and sociodemographic variables such as: age, place of residence, education, professional activity and maternal experience.
2. The obtained results suggest a need for educational initiatives, taking socio-demographic variables into account, which would inform women about the most frequent problems encountered in gestational diabetes.

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