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## Wpływ pomocy udzielanej choremu przez rodzinę na wyrównanie metaboliczne cukrzycy typu 2

## The impact of family support on metabolic control in patients with type 2 diabetes

### Streszczenie

**Wstęp.** Skrupulatne przestrzeganie zaleceń medycznych jest kluczowym elementem procesu terapeutycznego pacjentów z cukrzycą typu 2.

**Cel.** Celem niniejszej pracy była próba oszacowania, w jakim zakresie i z jakim zaangażowaniem członkowie rodziny pacjentów z cukrzycą typu 2 uczestniczą w wybranych czynnościach związanych z terapią cukrzycy oraz czy ma to wpływ na wyrównanie metaboliczne cukrzycy.

**Materiał i metody.** Badaniu poddano 136 chorych na cukrzycę typu 2. Przeprowadzono badanie przedmiotowe, badania laboratoryjne (hemoglobina glikowana A1c, glukoza na czczo i profil lipidowy) oraz badanie ankietowe, uwzględniające udział członków rodziny w wybranych aspektach postępowania terapeutycznego u pacjentów z cukrzycą.

**Wyniki.** Wyniki przeprowadzonego badania wskazują, że zakres wsparcia i zaangażowanie rodziny w pomoc choremu na cukrzycę typu 2 jest niezadowalający, a otrzymane wsparcie nie przekłada się na lepszy stan wyrównania metabolicznego cukrzycy. Wykazano znaczne zaniedbania w zakresie udziału członków rodziny, jak i samych pacjentów w edukacji diabetologicznej.

**Wnioski.** Uzyskane wyniki wskazują na konieczność intensyfikacji edukacji rodzin pacjentów chorujących na cukrzycę typu 2, tak aby zapewniały one większe wsparcie chorym, szczególnie w aspekcie przestrzegania zaleceń dietetycznych.

### Abstract

**Introduction.** Conscientious compliance with medical prescriptions is a key element of the therapeutic process in patients with type 2 diabetes.

**Aim.** The aim of this study was to assess to what extent and with what involvement the family members of patients with type 2 diabetes participate in selected activities related to the treatment of diabetes and whether it has any impact on metabolic control.

**Material and methods.** A total of 136 patients with type 2 diabetes were examined. The research was conducted by means of physical examination, laboratory tests (glycosylated hemoglobin A1c, fasting glucose and lipid profile) and questionnaire survey assessing family members' participation in selected aspects of the therapeutic procedures in patients with diabetes.

**Results.** The results of the study indicate that the extent of support and family involvement in helping the patient with type 2 diabetes are not satisfactory, and the received support is not reflected in better glycaemic control. The study showed a significant negligence not only in participation of family members but also of the patients themselves in diabetes education.

**Conclusions.** The results indicate the need to intensify the education of the families of patients suffering from type 2 diabetes, so that they provide greater support to the sick, particularly in terms of compliance with dietary recommendations.

**Słowa kluczowe:** wsparcie rodziny, cukrzyca typu 2, wyrównanie metaboliczne.

**Keywords:** family support, diabetes type 2, metabolic control.

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## INTRODUCTION

Type 2 diabetes is a chronic and progressive disease and the therapy requires from patient precise and constant observing dietetic recommendations, physical effort, taking medicines and conducting self-control of glycaemia. Implementation of these recommendations in practice is difficult for most patients. Many studies have proved that family support plays a significant role in keeping therapeutic discipline and has a beneficial influence on glycaemic control in patient suffering from type 2 diabetes [1-5].

## AIM

The aim of the study was an attempt of estimating the range and intensity of involvement of family members of patients with type 2 diabetes in selected activities connected with the diabetes therapy and how it affects treatment effects evaluated on the basis of biochemical parameters of metabolic control of diabetes and values of arterial blood pressure.

## MATERIAL AND METHODS

A total of 136 consecutive patients with type 2 diabetes were examined, including 71 women and 65 men aged  $62 \pm 8.86$ , who reported for medical control to Diabetes Clinic of the Medical University of Lublin from September 2007 to February 2008. Mean duration time of diabetes in the examined group was  $8.71 \pm 6.89$  years. The study assumed that diabetes lasting 0-5 years is a short-term diabetes, 6-10 years – diabetes with medium duration and over 10 years – a long-term diabetes.

A previously designed self-designed questionnaire assessing socio-economic and family situation of patients was used in the study [6]. The respondents evaluated frequency of participation of their family members in selected activities with the use of a 5-point scale (from 'always' to 'never'). The obtained scores were grouped in three categories: high level of participation (always, often), low level of participation (sometimes, seldom) and no participation (never).

On the basis of the respondents' declarations, the assessment of participation of patients and their family members in diabetes education was conducted as well. Medical examination included three-fold measurement of arterial blood pressure and then arithmetic mean was calculated.

A degree of metabolic compensation of diabetes was assessed on the basis of routinely determined selected biochemical parameters such as: concentration of HbA1c, fasting glucose, total cholesterol (TCh), HDL-cholesterol (HDL-Ch), LDL-cholesterol (LDL-Ch) and triglycerides (TG) in venous blood serum and values of systolic (sRR) and diastolic (dRR) arterial blood pressure. The following values were assumed as correct: for HbA1c  $\leq 6.5\%$ , fasting glycaemia  $\leq 110$  mg/dl, TCh  $< 175$  mg/dl, LDL-Ch  $< 100$  mg/dl, HDL-Ch  $> 50$  mg/dl for women and HDL-Ch  $> 40$  mg/dl for men, TG  $< 150$  mg/dl, RR  $< 130$  mmHg and dRR  $< 80$  mmHg, according to recommendations of the Polish Diabetes Association (PDA) from 2007 [7].

Chi-square test and Spearman's test were used in statistical analysis. The values below 0.05 were assumed as the significance level.

## RESULTS

The results of the conducted study have shown that only every third patient with type 2 diabetes receives a high level of family support within regular meal consumption (34.4%), avoiding consumption of simple carbohydrates (34.0%), control the amount of consumed meals (30.8%), preparation and shared consumption of dietetic meals (both – 30.6%). Whereas a low level of participation of family members concerns mainly shared consumption of dietetic meals with patient (47.2%), buying dietetic food (44.9%) and exerting pressure on regular physical exercises (44.6%).

Involvement of family members in analyzed activities connected with the diabetes therapy in the respondents is presented in Table 1.

Most respondents declared lack of family participation in such activities as: insulin injection (88.4%), administration of oral medicines (79.6%) and conducting glycaemia self-control (75.2%).

**TABLE 1. The participation level of family members in selected activities connected with the diabetes therapy among the respondents.**

Activity	The participation level of family members					
	High		Low		None	
	n	%	n	%	n	%
Buying dietetic food	21	17.8	53	44.9	44	37.3
Cooking dietetic meals	37	30.6	36	29.7	48	39.7
Consumption of dietetic meals together with patient	37	30.6	57	47.2	27	22.3
Exerting influence on regular meal consumption	41	34.4	36	30.2	42	35.3
Controlling the amount of consumer meals	21	18.1	38	32.7	57	49.1
Care of avoiding consumption of simple carbohydrates	39	34.0	30	26.1	46	40.0
Exerting influence on regular physical exercises	26	21.5	54	44.6	41	33.9
Reminding about taking medicines	33	27.7	31	26.0	55	46.2
Administration of oral medicines	4	3.6	19	16.8	90	79.6
Injection of insulin	4	9.3	1	2.3	38	88.4
Help in glycaemia self-control	10	9.2	17	15.6	82	75.2
Help in self-control of arterial blood pressure	21	18.8	27	24.1	64	57.1

### **Participation of family members in selected activities depending on duration of diabetes in respondents**

A significant reverse dependence was revealed between help provided by family members in conducting self-monitoring of glycaemia and arterial blood pressure and duration of diabetes (adequately  $r=0.005$ ,  $p=0.019$  and  $r=0.011$ ,  $p=0.041$ ). Support in conducting blood glucose self-monitoring with a glucose meter is received by 36.6% of patients with short-term diabetes, 28.6% – with diabetes of medium duration and 10% – with long-term diabetes; whereas help in controlling arterial blood pressure in domestic conditions is received by 55.8%, 43.3% and 28.3% of the respondents. No significant dependence was found between duration of diabetes and participation of family members in other studied activities.

### **Participation of family members in selected activities depending on place of residence**

It was reported that actually patients from rural areas more often than patients living in the city of Lublin received a high level of family support in conducting self-monitoring of glycaemia and arterial blood pressure ( $p=0.029$  and  $p<0.001$ ).

### **Participation of family members in selected activities vs. selected parameters of metabolic control of diabetes**

No significant relationships were found between participation of family in the studied activities and biochemical parameters of metabolic control such as HbA1c, fasting glycaemia and lipid profile.

Analyzing the relationship of arterial blood pressure with participation of family members in selected activities, only in men a significant relationship between diastolic arterial blood pressure and effects of family on their regular meal consumption ( $r=0.002$ ,  $p=0.007$ ) was stated. Satisfactory dRR values are obtained by 77.8% of male patients with a high level of support in the scope of regular meal consumption, 22.2% – with a low level of support and 0.0% – without this kind of help. Whereas such relationship was not found in women. Moreover it should be emphasized that in fact more often men receive help within this activity than women ( $p<0.001$ ). However, significant relationships between participation of family in selected activities and age, marital status, educational level, number of people per household as well as self-evaluation of their own material and housing situation were not revealed.

### **Participation of patients and family members in diabetes education**

Nearly every third respondent (31.4%) said that he/she had participated in diabetes education after the diabetes diagnosis. But only 9 people (6.6% of the respondents) answered positively to the question whether someone from their family took part in education about proceeding in diabetes.

## **DISCUSSION**

The results of the conducted study show that the range of support and involvement of family in assisting patient with type 2 diabetes is unsatisfactory and the results depend to a large extent on a kind of evaluated activity associated with the diabetes therapy. It was shown that most patients

do not receive help consisting in insulin and oral medicine administration and conducting glycaemia self-monitoring. It is probably connected with a sufficient level of education and self-reliance of patients within those activities but it may also result from fatigue or 'burning out' of family. It is worth considering since at the same time it was stated that family members of patients living in rural areas four times more often became involved in help in conducting glycaemia and arterial blood pressure self-monitoring in comparison with patients from the city of Lublin. The study also revealed a significant relationship between duration of diabetes and the level of family support within controlling of glycaemia and blood pressure. Along with extension of the diabetes duration participation of family decreases in providing this kind of help. Further research should analyze whether such changes of behaviour along with time passing result from an increasing patient's experience in proceeding with his disease or from intensifying fatigue of both patient and his/her family.

The study revealed that patients with type 2 diabetes can most often count on a high level of support from their family in regular meal consumption and avoiding consumption of simple carbohydrates. Similar results to these from our study determining the range of family support received by patients with type 2 diabetes were obtained by Yun and Kim [3]. The researchers found that family members showed the highest level of support for patients in regular meal consumption. Also Kim revealed that help of family in observing therapeutic recommendations by people with type 2 diabetes was manifested most often in controlling the time of taking meals [8].

On the basis of the conducted research it was also stated that in case of most patients (77.8%) family members revealed involvement in the form of shared consumption of dietetic meals. Similarly Epple et al. showed that almost half of patients with type 2 diabetes received support from their families within shared consumption of dietetic meals [4]. These results indicate that active participation of family members in observing dietetic recommendations can be an important element of support in the therapy of patients with type 2 diabetes.

The influence of family support on glycaemic control in patients with type 2 diabetes is ambiguous. Most studies concerning this issue showed that general family support has a beneficial effect on the glycaemia control in patients with type 2 diabetes [1-3]. A high level of support more often occurred in patients with well-compensated glycaemia. Chyun et al. in a study assessing cardiovascular risk among patients with type 2 diabetes proved that a higher level of support from family and friends is associated with the occurrence of better lipid profile [9] Also Epple et al. observed the lowest concentration values of triglycerides, total cholesterol and HbA1c in patients for whom most meals were prepared by family members [4]. A recently published study has revealed that a higher level of family support in dietetic treatment is connected with lower values of HbA1c indeed [5]. Whereas Kim et al. in research covering patients with type 2 diabetes aged over 60 did not find a significant relationship between family support and metabolic compensation of diabetes assessed on the basis of the level of HbA1c and glucose

concentration preprandial and postprandial [10]. Similarly in the presented own study no significant relationship was revealed between the level of participation of family members in the studied activities and biochemical parameters of metabolic compensation such as concentration of HbA1c, fasting glucose and blood lipids. It was only proved that family assistance in regular meal consumption has an important influence on obtaining target values of diastolic arterial blood pressure but this influence was only confirmed in men. It may result from a bigger size of male group which gets support in that activity, compared to females. An explanation of a relationship of this kind of help only with diastolic pressure requires further research.

Lack of significant relationship between the level of family participation in the studied activities and biochemical parameters of metabolic compensation can be caused by insufficient knowledge of family members on treatment and proceeding in type 2 diabetes. Confirmation of this kind of thinking is the fact that only 6.6% of the respondents declared that someone from their family took part in diabetes education. Because of that, patients cannot rely on proper support in offered by their families. In the above mentioned study by Kim et al. in which also the relationship between family support and treatment effects related to carbohydrate metabolism was not found, the proportion of patients with type 2 diabetes whose family members participated in diabetes education was low and it was 18.4% (but it was three times bigger than in the presented own research) [10].

Our study also showed that participation of patients themselves in education about proceeding in diabetes was unsatisfactory and applied only to 1/3 of the respondents. Certainly it has influence on the obtained research results since education is an indispensable element in a therapeutic process of patients with diabetes and it is responsible for efficiency and obtaining expected treatment effects [11]. But at the same time research carried out by Ławska et al. revealed that most patients with diabetes expect support from family [12]. The study confirmed that nearly 90% of the respondents think that involvement of family in the diabetes education is important to them.

Therefore there is a great need of developing and extending the scope of diabetes education plans covering not only patients themselves but also their family members [3,13,14]. Through active participation in educational programmes patients and their families should acquire and constantly deepen their knowledge and practical skills in overcoming everyday problems connected with the therapy of type 2 diabetes. A special emphasis should be put on trainings in diabetes diet for those family members who deal with preparing meals for their sick relatives. Systematically repeated education should result in metabolic control and give measurable benefits exceeding medical aspect but which also have social and economic dimension.

## CONCLUSIONS

The obtained results indicate a necessity of intensification of family education of patients suffering from type 2 diabetes so that they provide a bigger support for patients especially in the aspect of observing dietetic regime. We should hope it will result in better metabolic control of diabetes.

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