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Health behaviour among patients with type 1 and 2 diabetes mellitus reported to provincial diabetic outpatient department

World Health Organisation estimates that in 2000 out of 6 milliard people all over the world, about 175 million suffer from diabetes mellitus (DM). In Poland in 2000 about 1.5 million inhabitants were affected by the disease. According to Polish authors (6), the percentage of diabetics in Poland are found between 4 and 6% in cities and 2 and 4 % – in other places. In the majority of European countries the value is estimated at 2 to 6% of DM patients. DM is a disease whose cost of treatment is very high and requires over 1 milliard zloty a year in our country. Therefore, it is necessary to increase the effectiveness of prevention, treatment of DM and its complications by the use of improved methods and the promotion of positive health behaviours reducing harmful ones in diabetic patients (6). Health behaviours are ways of human activity which influence health and stamina. We can divide them into positive health behaviours that support and improve human health such as physical activity, rational diet, etc. and negative unhealthy ones that lead to weak health and rise vulnerability for diseases – such as smoking cigarettes, etc. (15). Both in primary and secondary prevention they play an important role.

The aim of the study was to assess positive and negative health behaviours and the presence of diabetes mellitus complications in type 1 and 2 DM patients of provincial diabetic outpatient department.

MATERIAL AND METHODS

The studied population included 53 DM patients of provincial diabetic outpatient department in Biała Podlaska. Body mass index (BMI) defined as quotient of body mass in kilograms (kg) and height in metres square (m²) were assessed to select subjects with normal BMI (<25 kg/m²) and elevated BMI (>=25 kg/m²), indicating overweight or obesity. Participants filled in a questionnaire consisting of questions applying to personal data, type of DM and a way of treatment, the length of the disease since diagnosing, frequency of plasma glucose control, medical check-ups, DM complications, coexistent diseases, family history of DM, health behaviours (physical activity, appropriate diet, smoking) and patients' knowledge about the disease.

Statistical analysis performed by means of statistical programme STATISTICA 5.0 was based on non parametric chi square test (also with Yates correction) at significance level of $p \leq 0.05$. No statistical significance was marked as NS.

RESULTS

The studied group included 53 patients of provincial diabetic outpatient department, aged 17–85, mean 57.5 ± 16 years: 56.6% of women and 43.4% of men. Of all of them 22.6% had elementary education, 20.8% – vocational, 45.3% – secondary and 11.3% – higher. The majority of subjects (71.7%) were retired, 28.3% – worked. BMI was found between 19.7 and 45, mean 28 ± 4.6 kg/m². Of all, 39.6% had normal body mass and 60.4% – overweight or obesity.

Type 1 DM was diagnosed in 15% of patients and type 2 – in 85%. The length of the disease since diagnosing was from 1 to 36, mean 9.7 ± 7.8 years. 34% were admitted to hospital at least once. The number of hospital stays ranged from 1 to 10, mean 2 ± 2.5 times. Most subjects (98%) systematically underwent specialised medical check up, at least once per three months. Over a half of the patients (52.8%) were given only oral medication, 20.7% – insulin and 20.8% – both. Some respondents (5.7%) were only on a diabetic diet. Insulin-therapy duration ranged from 1 to 24, mean 5.7 ± 5.7 years. Among 41.5% of those who were given insulin injections, 7.5% – applied insulin once a day, 18.9% – twice and 15.1% – more. Over a half of the patients (52.8%) determined plasma glucose level at home on their own, the rest – with the aim of medical staff. About 40% of respondents controlled the glucose level in blood at least once a day, the rest – less frequently.

Of all the respondents, more than a half (56.6%) were physically active. The number of hours of such activity as walking, riding a bicycle, jogging, swimming ranged from 2 to 70, mean 11.2 ± 3.4 hours a week. Among all participants, 20.7% smoked cigarettes, the number of cigarettes smoked a day was from 2 to 20, mean 11.7 ± 6.5 a day. Only about one third of the subjects (28.3%) checked their blood pressure systematically. The majority of diabetics (69.8%) made regular appointments with an ophthalmologist and 67.9% – took care of their feet (Fig. 1).

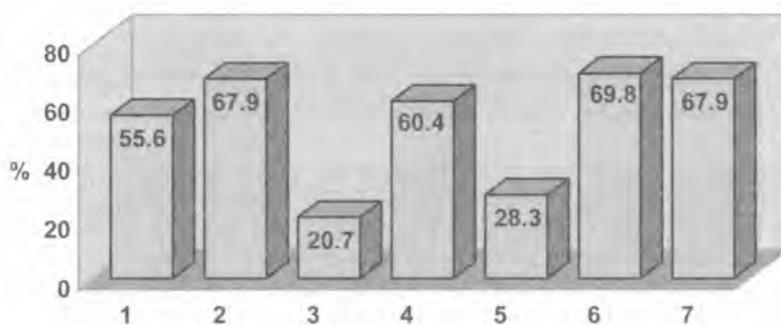


Fig. 1. Health behaviours in the studied population; 1 – physical activity, 2 – diabetic diet, 3 – smoking, 4 – overweight and obesity, 5 – blood pressure measurement, 6 – ophthalmology control, 7 – taking care of feet

Over 80% of the subjects suffered from other diseases: hypertension (56.6%), coronary artery disease (30.2%), degenerative joint disease (34%), gastropathy (13.2%), thyroopathy

(7.5%), kidney (7.5%), liver (3.8%) or pulmonary (1.9%) disease. In 37.7% cases the studies found hyperlipidaemia, while about 20% patients used an appropriate diet and drug therapy.

Diabetic patients' complaints about DM complications involved: deterioration of the sight (52.8%), proteinuria or nephropathy (15%), paraesthesiae of the "pins and needles" type in limbs (47.2%), so-called "diabetic foot" (7.5%), stroke (1.9%), frequent cutaneous problems (1.9%), respiratory system (5.7%) or urinary tract (11.3%) infections, gingivitis (5.7%), coronary artery disease symptoms (30.2%) and past myocardial infarction (9.4%) (Fig. 2). Family history of diabetes mellitus was observed in 35.8% of the patients. Most subjects (71.7%) considered their knowledge of the disease to be sufficient, but not very good. Almost all were aware of the necessity of smoking cessation (98.1%), using a special diet (98.1%), but only 67.9% were on a strict diet and 45.3% of respondents were able to keep their weight steady.

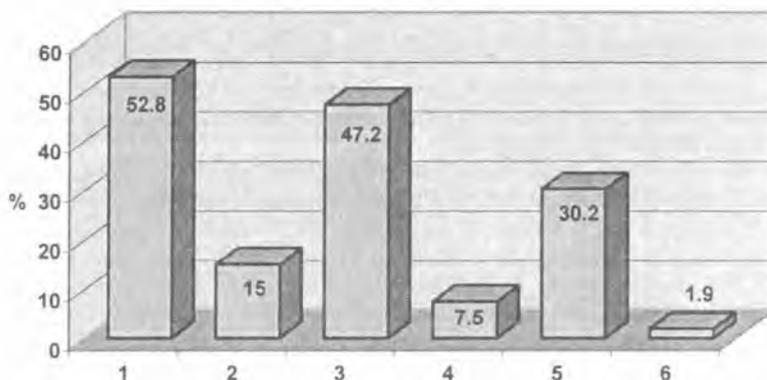


Fig.2. Complications of DM in the studied population; 1 – retinopathy, 2 – nephropathy, 3 – paraesthesiae „pins and needles”type, 4 – so-called „diabetic foot”, 5 – coronary artery disease, 6 – stroke

As regards the type of DM, it was observed that type 1 diabetics were more frequent admitted at hospital than type 2 (87.5% vs 24.4%) ($p < 0.05$). Type 2 diabetics more often underwent medical control – at least once a quarter of a year (100% vs 87.5%) (NS). Type 1 diabetics were more systematical about plasma glucose control – they measured it at least once or even a few times a day (87.5% vs 31.1%) ($p < 0.05$), mainly at home on their own unlike type 2 diabetics (100% vs 44.4%) ($p < 0.05$), who preferred the aid of medical staff (55.6% vs 0%) ($p < 0.05$).

Health behaviours varied depending on the type of DM. Among type 1 diabetics there was a higher percentage of physical activity (75% vs 53.3%) (NS), but also more smokers (62.5% vs 13.3%) ($p < 0.05$). More patients with type 1 DM were on a strict diet (87.5% vs 64.4%) (NS), but more patients with type 2 DM visited an ophthalmologist systematically (87.5% vs 66.7%) (NS). The percentage of subjects who took care of their feet was comparable in type 1 and 2 DM patients (62.5% vs 68.9%) (NS). It turned out that physically active diabetics were more careful about their feet than non active ones (80% vs 52.2%) ($p < 0.05$). More type 1 diabetics took blood pressure regularly (50% vs 24.4%) (NS). There were comparable percentages of patients with type 1 and 2 DM who were aware of the necessity of smoking cessation (100% vs 97.8%) (NS) and the use of diabetic diet (100% vs 97.8%) (NS). Among those who declared

keeping on weight the percentage of type 1 and 2 diabetics was similar (50% vs 55.6%) (NS); however, there were more subject with normal BMI among type 1 DM patients (75% vs 33.3%) ($p < 0.05$). No statistical significance was found about the presence of DM complications and type of diabetes. Among type 1 DM subjects there was a higher percentage of those who regarded their knowledge about DM as sufficient to be able to deal with the disease (100% vs 66.7%) (NS). Physically active diabetics were more educated in the subject of DM than non active ones (83.3% vs 56.5%) ($p < 0.05$).

DISCUSSION

Morbidity rates of diabetes mellitus have been rising recently as a result of civilisation development and increasing prosperity in the world. High mortality rates in DM are strongly associated with its severe complications – micro - and macroangiopathy such as coronary artery disease (CAD) (9), retinopathy and adult blindness (especially type 2 DM) (3) and nephropathy (2). Diabetic neuropathy with peripheral arteries atherosclerosis leads to so-called “diabetic foot” and is a reason for lower limbs amputation in adults (4). Therefore, it seems necessary both to promote positive health behaviours, reducing harmful ones, and to intensify diabetes and coexistent diseases treatment to delay diabetes complications. Diabetes Control and Complications Trial (DCCT) (7) and United Kingdom Prospective Diabetes Study (UKPDS) (13) proved a beneficial influence of intensified DM treatment on late complications development. To avoid vascular complications it is important to treat also hyperglycaemia and coexistent arterial hypertension. In the authors’ own study only one third of the subjects took blood pressure regularly (patients with type 1 DM measured it more often), although in 56.6% hypertension was diagnosed. The role of treatment of dyslipidaemia being DM risk factor and using hypolipidaemic medication for reduction of CAD incidence in diabetics was observed in many studies (10). In the authors’ own research, hyperlipidaemia was diagnosed in 37.7% patients but only 20% - underwent a suitable therapy. DM prevalence (especially type 2) is strongly associated with obesity. About 80% of type 2 DM patients are obese when the disease is diagnosed (6). In the authors’ own study the percentage of obese participants was lower (60%), because we also included type 1 diabetics, who usually had normal BMI. Over 40% of respondents were not able to keep weight; however, there was observed much less weight gain in type 1 DM subjects. Secondary prevention of DM should include smoking cessation (6). In the authors’ own research about one fifth of the studied smoked and there were more smokers among type 1 diabetics.

To deal with DM properly plasma glucose concentration should be determined and if there is insulin-therapy – regular injections should be applied. Diabetic patients are considered to be rather careless about it. In one of the studies only 7% of participants were observed to deal with DM properly according to medical advice (5). Most patients were careless about the doses and regularity of insulin administration, measurement of plasma glucose concentration, physical activity and required diet. Results of the authors’ own study led to the same conclusions: only half of the patients checked plasma glucose level, 40% – once or a few times daily, the rest – not so often. Type 2 diabetics preferred controlling plasma glucose concentration with the aid of medical staff only, however, type 1 DM patients checked up the serum glucose concentration very often doing it on’ their own.

A suitable diet and regular physical activity are the basic elements of the DM management. Physical exercises improve DM control, plasma lipids profile, lower blood pressure and risk of complications (12). Permanent physical training declined daily requirement for hypoglycaemic medication. Because of those obvious benefits, American Diabetes Association (ADA) included physical exercises in DM management (1). A study involving 1419 women with type 2 DM proved that apart from older age, smoking, alcohol intake, hypertension and hyperlipidaemia, lack of physical activity played important role in DM incidence. Both

regular physical training and a 1-hour stroll even once a week declined DM incidence (8). In the authors' own study over a half of the participants (especially type 1 DM subjects) were physically active. Type 1 DM patients were more often on a strict diabetic diet.

The most severe diabetes complications include CAD (9), retinopathy (3) and nephropathy (2). An increased risk of retinopathy among diabetic patients was observed in many studies according to the results of research based on 2964 white subjects, 37% patients with a newly diagnosed type 2 DM already had retinopathy, and 4% – its advanced stage (11). That is why each diabetic requires regular eyegrounds investigations at least once a year. In the authors' own study the majority of subjects visited an ophthalmologist systematically, more often – type 2 DM patients. Proteinuria and nephropathy occurred in 15% analyzed subjects. About one third of the subjects were diagnosed CAD and about 10% – past myocardial infarction, which confirmed increased vulnerability for CAD in diabetic patients. Taking special care of feet in DM management is considered essential – proper care and avoiding injuries (4). In the authors' own study the majority of patients (70%) were careful about it and the percentage of type 1 and 2 diabetics were comparable, and physically active patients were observed to be more careful than non active ones.

According to ADA guidelines, measurement of plasma glucose concentration, blood pressure, screening procedures to detect proteinuria, ophthalmologist control, accurate foot care, strict diabetic diet belong to proper DM management (1,2,3,4). It is closely connected to the education level of diabetic patients. In Poland the problem of education process in diabetics has not been settled yet. In the analysis performed by a few Polish authors in one of the Polish regions (14) there were found only a few (12.2%) diabetics who regarded their knowledge of diabetes as very good, quite enough to deal properly with the disease – most of them were administered insulin. In the authors' own study a higher percentage of the investigated (70%) declared knowledge about diabetes, but actually it was rather superficial. Type 1 DM patients seemed to be better educated than type 2 DM subjects.

Education of diabetic patients is one of the most important tasks in DM management. Suitable diabetes treatment is possible due to the patient's self-control, only close co-operation between a patient and his physician makes diabetes treatment easier and effective.

CONCLUSIONS

1. Most diabetic patients of the studied population lead a fairly healthy life-style: they are physically active, they use a suitable diabetic diet, do not smoke, regularly control weight, plasma glucose concentration and blood pressure, declare systematical ophthalmologist control and take special care about their feet.

2. Type 1 diabetic patients are more careful about DM management than type 2 diabetic subjects.

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SUMMARY

The cost of management of diabetes mellitus in Poland, which has become a very common disease recently, is estimated at over 1 milliard zloty a year. Therefore, it is necessary to increase the effectiveness of prevention and treatment of DM and its complications both by using improved methods and the promotion of positive health behaviours such as physical activity, rational diet, and reduction of harmful ones such as smoking, in diabetic patients. The aim of the study was to assess positive and negative health behaviours and the presence of diabetes mellitus complications in type 1 and 2 DM patients of provincial diabetic outpatient department. The study included 53 DM patients who reported to diabetic outpatient department in Biala Podlaska. The participants filled in a questionnaire consisting of some questions applying to the type of DM and a way of treatment, frequency of plasma glucose measurement, medical check-ups, DM complications, coexistent diseases, family history of DM and health behaviours (physical activity, appropriate diet, smoking etc.). The results allowed to draw the following conclusions: 1. the majority of diabetic patients of the studied population lead a fairly healthy life-style: they are physically active, use a suitable diabetic diet, do not smoke, regularly control weight, plasma glucose concentration and blood pressure, declare systematical ophthalmologist control and they take special care about their feet; 2. type 1 diabetic patients are more careful about DM management than type 2 diabetic subjects.

Zachowania zdrowotne pacjentów z cukrzycą typu 1 i 2, leczonych w rejonowej poradni diabetologicznej

Cukrzyca jest chorobą o ogromnym zasięgu społecznym, na której leczenie w Polsce rocznie wydaje się ponad miliard złotych. Z tych powodów dąży się do zwiększenia skuteczności zapobiegania oraz leczenia cukrzycy i jej powikłań. Oprócz stosowania ulepszonych metod leczenia można to osiągnąć poprzez rozpowszechnienie zachowań prozdrowotnych, takich jak np. aktywność fizyczna, racjonalne żywienie oraz eliminowanie zachowań antyzdrowotnych, jak np. palenia papierosów. Celem pracy była ocena zachowań zdrowotnych oraz częstości występowania powikłań cukrzycy u osób z cukrzycą typu 1 i 2, leczonych w poradni diabetologicznej. Zbadano 53 osoby leczące się z powodu cukrzycy w poradni diabetologicznej w Białej Podlaskiej. Analizowano między innymi częstotliwość wizyt w poradni specjalistycznej, sposób leczenia, kontrolę glukozy we krwi, towarzyszące powikłania i współistniejące schorzenia oraz zachowania zdrowotne (aktywność fizyczną, dietę, palenie papierosów itp.) w zależności od typu cukrzycy. Uzyskane wyniki pozwoliły na sformułowanie następujących wniosków: 1) wśród osób leczących się na cukrzycę w badanej populacji większość wprowadza zachowania prozdrowotne, takie jak systematyczna aktywność fizyczna, stosowanie właściwej diety, niepalenie, kontrola masy ciała, regularne pomiary glikemii i ciśnienia tętniczego, kontrole okulistyczne, częsta pielęgnacja stóp; 2) osoby z cukrzycą typu 1 wykazują się większą dbałością w prowadzeniu higienicznego trybu życia niż osoby z cukrzycą typu 2.