

The prevalence of type 1 diabetes mellitus among adolescents and adults in Lithuania during 1991–2004

Rytas Ostrauskas

Institute of Endocrinology, Kaunas University of Medicine, Lithuania

Key words: type 1 diabetes mellitus; register; prevalence; adolescents; adults.

Summary. *Objective.* The goal of this study was to summarize the data on the prevalence of type 1 diabetes mellitus among Lithuanian population aged more than 15 years.

Material and methods. The data on patients aged more than 16 years were collected with the help of general practitioners, endocrinologists, and physicians-internists working in the diabetes care in all towns and regions of Lithuania. The data on patients aged 14 to 16 years were obtained from the National Register of Diabetes Mellitus in Childhood in Lithuania.

Results. In Lithuania, on December 31, 1991, there were 2179 adolescent and adult patients with type 1 diabetes mellitus or 75.21 per 100 000 inhabitants of the same age group (95% Poisson CI 72.12–78.43), and at the end of 2004 – 3996 or 140.69 (95% Poisson CI 136.40–145.12), respectively. During a 14-year period, the mean increase in the number of type 1 diabetic patients was 144.85 ± 23.32 persons per year or $4.66 \pm 1.17\%$ or 4.04 ± 1.19 cases per 100 000 population (for males 85.54 ± 10.82 or $5.06 \pm 1.02\%$ or $6.81 \pm 1.57/100\ 000$ and for females 54.23 ± 9.05 or $3.93 \pm 0.86\%$ or $3.56 \pm 1.05/100\ 000$). Regression-based linear trends showed that the prevalence of type 1 diabetes mellitus among population aged more than 15 years had a tendency to increase. The prevalence rates of type 1 diabetes mellitus among adolescent and adult subjects, adjusted for Lithuanian male and female age groups, were 80.64/100 000 and 70.23/100 000 in 1991 ($P < 0.05$) and 166.52 and 117.63 in 2004 ($P < 0.05$), respectively.

Conclusions. The prevalence of type 1 diabetes mellitus among Lithuanian females aged more than 15 years was lower than among males. The register provides the possibility of highly precise collection of the data on patients from various medical care units in Lithuania.

Introduction

Diabetes mellitus is well recognized as a major global health problem. Both genetic and environmental factors play a role in the etiology of type 1 diabetes mellitus (T1DM) (1, 2). Genetic susceptibility has an impact on both the initiation and progression of the autoimmune process leading to clinical T1DM (2). A rapid increase in the incidence and prevalence of T1DM that cannot be explained by changes in the genetic susceptibility led us to look for environmental causes (1). The most probable explanation for the geographical variations among the municipalities in the region in the risk of developing T1DM is that local environmental factors play a part in the process leading to the disease (3). The fascinating puzzle and unsolved questions of the etiology and pathogenesis of T1DM have emphasized the importance of epidemiological studies in recent years. Such research may contribute to understanding the role of predisposing, initiating, or precipitating factors, which all may have a role in

the development of T1DM (4, 5).

The Lithuanian National Registry of Adults with Type 1 Diabetes Mellitus was established on January 1, 1991. It aims to describe the epidemiological distribution of T1DM in a well-defined population of moderate size and to provide a sound framework for longitudinal population-based research on the disease. One of the stages of the register was the recruitment of subjects with T1DM of all ages who were resident in Lithuania and treated with insulin on chosen prevalence dates, from December 31, 1991, to December 31, 2004.

The present article presents the results of a cross-sectional prevalence survey regarding those adolescent and adult subjects who were considered to have T1DM.

Material and methods

The data used for the analysis came from two data collecting systems: the Lithuanian National Registry

of Diabetes Mellitus (established in 1983) and the Lithuanian National Registry of Adults with Type 1 Diabetes Mellitus (established in 1991).

During 1991–2004, information on population aged more than 14 years was obtained from the Lithuanian Statistics Department.

Diabetes mellitus was defined according to the criteria of World Health Organization (6). All diabetic patients, permanent inhabitants of Lithuania, who required insulin treatment were included into the register. This prospective, ongoing study of T1DM in Lithuania was conducted on a nationwide basis and involved physicians from all health care units of all 12 large towns and 42 countryside regions. Eligible subjects throughout Lithuania were recruited through outpatient clinics over a 14-year period, during 1991–2004. The target population of eligible subjects was enumerated by the register, based on special reports-questionnaires fulfilled by physicians of all Lithuanian outpatient clinics, responsible for diabetes care.

The registration of T1DM cases in 0–14-year age group was performed by Lithuanian National Register of Diabetes Mellitus in Childhood. Details of T1DM registration procedure in childhood have been published elsewhere (7). Data on subjects with T1DM, aged more than 14 years, were collected by Center of Lithuanian National Register of Type 1 Diabetes Mellitus in Adulthood. The following registration procedure of cases was used. The data until 1991 were collected retrospectively from all outpatient medical units of Lithuania. The list of all diabetic patients treated with insulin and followed up was used for the development of a database of retrospective primary data. We sent this list to endocrinologists and general practitioners in districts, and this list was returned at the beginning of 1991. The list included all T1DM patients (background data) diagnosed until January 1, 1991. Since 1991, information was extracted from the following reports:

- 1) Report about a person with newly diagnosed diabetes mellitus collected by physicians who diagnosed new cases of diabetes;
- 2) Control list of follow-up of all diabetic patients treated with insulin, which was used for retrospective and prospective inspection of primary database;
- 3) List of insulin-treated adults with newly onset diabetes at medical unit;
- 4) List of insulin-treated diabetic patients excluded from follow-up, with references on date of exclusion from local clinic due to migration or death, indicating the cause of death; duplicate of death certificate was added. The information about mig-

ration and death is obtained from this list, which is filled by general practitioners and endocrinologists annually.

The entry criteria for the register were as follows: diagnosis of T1DM made by a physician, residence in Lithuania, and treatment with insulin on the prevalence date. Not having a universally accepted epidemiological definition of T1DM in adolescence and adulthood, additional criteria for eligibility for the present study were age of less than 40 years at onset and insulin treatment commenced at diagnosis or within 2 weeks before diagnosis.

Information obtained from all sources was entered into the computer-based information system. A database was created using Clarion 2.1 software package. The Statistica 6.0 and Epi Info 3.2.2 software packages were used for statistical analysis of the data. The prevalence rates for males and females separately and together in 5-year age groups (15–19, 20–24, etc.) and 15–>75 were calculated per 100 000 persons per year at the end of each year (December 31). The direct age-adjustment of prevalence rates among males and females was done using 5-year intervals assuming yearly mean distribution of the standard Lithuanian population with the following proportions: 10% for 15–19-year age group; 9% for 20–24-, 25–29-, 30–34-, 35–39-, 40–44-, 45–49-year age groups; 7% for 50–54-year age group, 6% for 64–69-, 60–64-, 65–69-year age groups; 5% for 40–74-year age group; and 6% for >75-year age group. To determine differences between genders, χ^2 test was used (8). The 95% confidence intervals (CI) were estimated assuming Poisson distribution of the cases (9). The change in the prevalence of type 1 diabetes mellitus during 1991–2004 was estimated by fitting the linear regression with the annual prevalence data. The change in regression coefficient demonstrates the change in prevalence per year. The linear regression model postulates that $Y=a+bX+e$, where the “residual” e is a random variable with mean zero. The coefficients a and b are determined by the condition that the sum of the square residuals is as small as possible (8). Significance levels were set at P value lower than 0.05.

Results

In Lithuania, on December 31, 1991, there were 2179 more than 14-year-old adolescent and adult patients (1150 males and 1029 females) with T1DM or 72.21 per 100 000 inhabitants of the same age group (95% Poisson CI 72.12–78.44), 2441 (1292 and 1149) or 84.21 per 100 000 (80.93–87.62) in 1993; 2721 (1472 and 1249) or 93.71 (90.25–97.30) in 1995; 3051

(1677 and 1374) or 103.20 (99.60–106.93) in 1997; 3379 (1880 and 1499) or 114.26 (110.47–118.18) in 1999; 3672 (2049 and 1623) or 130.40 (126.25–134.69) in 2001; (2196 and 1692) or 137.41 (133.16–141.80) in 2003, and 3996 (2262 and 1734) or 140.69 (136.39–145.12) in 2004, respectively. The prevalence rates of T1DM per 100 000 inhabitants and their 95% Poisson confidence intervals in adolescence and adulthood at the end of 1991–2004 (December 31) by gender and 5-year age groups are presented in Tables 1 and 2. The prevalence rates of T1DM, adjusted for Lithuanian male and female age groups, were 80.64/100 000 and 70.23/100 000 on December 31, 1991 ($P < 0.05$), and were 166.52 and 117.63, respectively, on December 31, 2004 ($P < 0.05$). The prevalence rates among males increased with age up to the age of 40–44 years and among females up to the age of 35–39 years, after which they decreased progressively in both genders. The prevalence was higher among males than females. In 1991, χ^2 gender difference ($df=13$) was 42.95; 46.69 in 1992; 37.33 in 1993; 37.47 in 1994; 58.29 in 1995; 46.83 in 1996; 52.93 in 1997; 47.25 in 1998; 49.83 in 1999; 70.47 in 2000; 82.80 in 2001; 84.26 in 2002; 76.94 in 2003; and 69.91 in 2004 ($P < 0.05$ for each year).

In order to enhance the comparability of data across studies, estimates were also calculated in broader age ranges. The prevalence rates of T1DM among subjects of a broader age range on December 31, 2004, are presented in Table 3.

During the 14-year period, the mean increase in the number of T1DM patients was 144.85 ± 23.32 persons per year or $4.66 \pm 1.17\%$ or $4.04 \pm 1.19/100\ 000$ (for males 85.54 ± 10.82 or $5.06 \pm 1.02\%$ or $6.81 \pm 1.57/100\ 000$ and for females 54.23 ± 9.05 or $3.93 \pm 0.86\%$ or $3.56 \pm 1.05/100\ 000$).

Regression-based linear trends showed that the prevalence of type 1 diabetes mellitus (insulin-dependent) in more than 15-year-old males (Fig. 1), females (Fig. 2), and both (Fig. 3) had a significant tendency to increase.

Discussion

The prevalence of all forms of diabetes mellitus in all age groups worldwide was 2.8% in 2000 and is estimated to be 4.4% in 2030. The total number of people with all forms of diabetes mellitus is expected to increase from 171 million in 2000 to 366 million in 2030 (10).

A screening program performed in 1987 in Lithuania, based on the sample of 1698 urban and 2193 rural population, showed the overall prevalence of all

forms of diabetes mellitus was 2.30% in urban population aged 25–69 years (1.66% among males and 2.85% among females) and 2.14% in rural population aged 25–64 years (1.69% and 2.55% among males and females, respectively). The prevalence of diabetes adjusted for age was 2.04% and 1.93%, respectively. No significant differences were found in the epidemiological prevalence of diabetes in Lithuanian urban and rural population. It was noticed that diabetes mellitus was more prevalent among females from urban and rural regions than among males ($P < 0.05$) (11). The next study with the aim to evaluate the prevalence of carbohydrate disorders among 515 randomly selected 35–64-year-old inhabitants of Kaunas town was performed in 2001. Diabetes mellitus of all forms was diagnosed in 3.76% of males and 4.56% of females (12).

International Diabetes Federation estimated that approximately 4.9 million people (in all age groups) suffer from T1DM that makes up 0.09% of the world's population. The European region has the highest estimated number of people with T1DM (1.27 million), followed by the North American region (1.04 million) and the South East-Asian region (0.91 million). The estimated prevalence of T1DM is highest in the North American region (0.25%), followed by the European region (0.19%) (13).

In the previous study, no statistical significant differences between T1DM prevalence rates in different localities of Lithuania were observed (14). The experience of the 14-year functioning of the Lithuanian Register of Adults with Type 1 Diabetes Mellitus shows that not all cases of type 1 diabetes mellitus were registered in an active database. Inaccuracies can be caused by several reasons, *e.g.*, delayed data on patient's death; married women can be registered repeatedly after they change their family name and/or place of residence; patients who change the place of residence and leave one medical service are resigned in new one only when they need new supplies of insulin; when leaving Lithuania for permanent residence in other country patients do not inform the medical service, *etc.* In addition, the register data were supplemented by new data only once per year, and this factor also influences the inaccuracies of the data presented in this article. Since our register is ongoing and diabetes is a chronic disease, the physicians responsible for diabetes care are repeatedly asked to check their records; some cases who may have been initially overlooked can be reported later on, so the risk of under-reporting will gradually decrease. The data presented in this article should be interpreted as general indicators of T1DM prevalence in adolescence and

Table 1. Prevalence of type 1 diabetes mellitus among males during 1991–2004

Year	Prevalence rates per 100 000 inhabitants by age groups													Total (95% confidence interval)
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	>75	
1991	82.6	97.9	109.2	138.8	133.3	137.5	95.8	49.2	38.9	13.6	5.53*			85.7 (80.9–90.8)
1992	82.4	106.6	101.7	150.5	140.8	147.1	103.8	60.1	44.1	13.4	4.9			90.5 (85.8–95.7)
1993	87.5	112.2	111.2	146.1	164.4	147.6	121.0	65.1	42.1	22.8	8.8			96.4 (91.3–101.8)
1994	104.5	110.8	117.5	146.9	182.5	154.9	129.7	80.5	42.6	31.5	10.0			103.5 (98.2–109.1)
1995	98.7	105.7	134.3	157.7	196.4	156.3	142.1	95.3	42.7	40.6	11.5			109.7 (104.23–115.44)
1996	111.0	106.1	146.8	161.9	208.4	162.5	150.7	104.2	55.0	44.8	16.9			117.4 (111.6–123.5)
1997	113.4	112.6	163.0	159.5	219.9	170.7	158.5	113.5	67.5	50.9	16.3	2.4*		124.2 (118.4–130.3)
1998	104.5	125.0	171.7	179.2	217.6	196.6	157.7	131.5	72.5	48.4	27.6			131.5 (125.5–137.7)
1999	91.1	150.3	163.4	195.2	221.9	213.8	164.2	140.4	89.0	48.7	34.8			137.8 (131.8–144.1)
2000	85.6	152.7	159.1	207.9	229.37	233.0	164.7	153.1	104.8	48.5	43.9			143.1 (136.9–149.6)
2001	98.8	178.9	187.5	248.3	272.6	248.2	180.1	165.4	126.7	65.0	54.6	7.6		159.25 (152.5–168.3)
2002	54.3	171.6	197.2	263.3	269.1	268.0	186.5	173.5	139.5	79.1	62.8	13.2		163.8 (156.9–170.9)
2003	45.8	163.4	201.57	269.7	285.6	270.3	220.2	177.8	155.4	85.5	59.8	30.1		169.9 (162.0–178.2)
2004	38.7	132.2	228.7	263.4	305.2	275.7	228.9	186.2	157.1	110.5	62.8	61.1		174.3 (167.2–181.6)

* Rate insignificant. Values given in bold type indicate the highest prevalence rates as compared to other age groups.

Table 2. Prevalence of type 1 diabetes mellitus among females during 1991–2004

Year	Prevalence rates per 100 000 inhabitants by age groups													Total (95% confidence interval)
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	>75	
1991	87.5	125.2	89.3	112.6	110.7	108.9	52.6	43.5	24.8	15.8	6.3	1.8*		66.2 (62.2–70.3)
1992	88.5	127.8	68.9	116.7	120.5	114.3	54.4	51.13	26.5	16.7	9.2	1.8*		69.7 (65.7–74.0)
1993	92.0	127.0	109.7	113.8	130.4	118.4	66.6	56.3	27.5	17.5	11.9	1.8*		73.8 (69.6–78.1)
1994	101.5	115.4	130.0	110.0	134.1	118.9	82.8	53.3	39.8	18.5	14.5	1.5*		77.10 (72.9–81.6)
1995	99.4	119.3	135.9	109.7	139.9	120.1	98.8	51.24	43.2	20.5	17.75	1.32*		80.0 (75.7–84.5)
1996	105.6	105.4	152.1	113.8	144.4	122.5	113.3	54.1	45.1	26.1	17.2	2.5*		83.3 (78.9–88.0)
1997	103.0	118.4	154.3	123.0	142.9	134.0	117.7	56.1	53.3	28.0	18.1	2.3*		85.53 (81.1–90.2)
1998	87.0	126.2	157.8	136.1	139.3	142.1	121.3	68.6	58.4	28.9	18.9	6.7		90.0 (85.4–94.8)
1999	91.1	139.0	148.1	154.3	136.2	149.5	121.4	85.1	55.2	41.7	19.8	9.8		94.1 (89.5–99.0)
2000	92.5	140.2	147.1	161.3	138.9	158.1	122.4	101.3	52.9	45.2	21.9	13.9		97.2 (92.5–102.1)
2001	88.4	11.5	161.7	198.9	155.3	161.2	130.8	119.4	61.0	49.1	28.6	16.3		106.1 (101.1–111.4)
2002	71.6	149.5	166.2	208.2	158.8	161.1	141.3	123.3	64.8	57.3	30.9	20.4	1.4*	107.2 (102.1–112.5)
2003	62.8	136.9	173.1	209.8	172.6	160.4	153.1	130.5	76.3	62.9	31.9	28.0		110.1 (105.0–115.5)
2004	49.2	131.0	191.0	196.0	193.0	159.1	152.3	132.5	89.1	62.2	49.5	39.3		112.5 (107.3–117.9)

* Rate insignificant. Values given in bold type indicate the highest prevalence rates as compared to other age groups.

Table 3. Prevalence of type 1 diabetes mellitus in broader age range groups in 2004

Age group	Gender	Number of patients	Prevalence per 100 000	95% confidence interval	Male/Female diabetes mellitus prevalence ratio
15–24	Males	224	83.5	73.3–95.2	0.94
	Females	228	88.4	77.6–100.7	
15–29	Males	484	126.7	115.9–138.5	1.06
	Females	442	119.5	108.9–131.2	
15–34	Males	801	159.5	148.8–170.9	1.15
	Females	682	138.5	128.5–149.3	
15–39	Males	1177	188.1	177.7–199.2	1.26
	Females	828	149.7	139.8–160.3	
15–44	Males	1541	203.4	193.5–213.8	1.34
	Females	1151	151.5	143.0–160.5	
15–49	Males	1808	206.8	197.5–216.6	1.36
	Females	1349	151.6	143.72–159.9	
15–54	Males	1985	204.8	196.0–214.0	1.37
	Females	1496	149.5	142.1–157.3	
15–59	Males	2108	201.2	192.7–210.0	1.40
	Females	1585	144.0	137.1–151.3	
15–64	Males	2189	195.3	187.7–203.7	1.42
	Females	1648	137.1	130.6–143.9	
15–69	Males	2189	195.3	158.1–172.4	1.44
	Females	1648	137.1	130.6–143.9	
15–74	Males	2230	188.0	180.4–196.0	1.47
	Females	1698	130.3	124.2–136.6	
15–79	Males	2262	182.6	175.2–190.3	1.51
	Females	1734	124.3	118.6–130.3	
15–79	Males	2262	177.6	170.4–185.1	1.55
	Females	1734	112.4	107.2–117.8	

Values given in bold type indicate the highest prevalence rates as compared to other age groups.

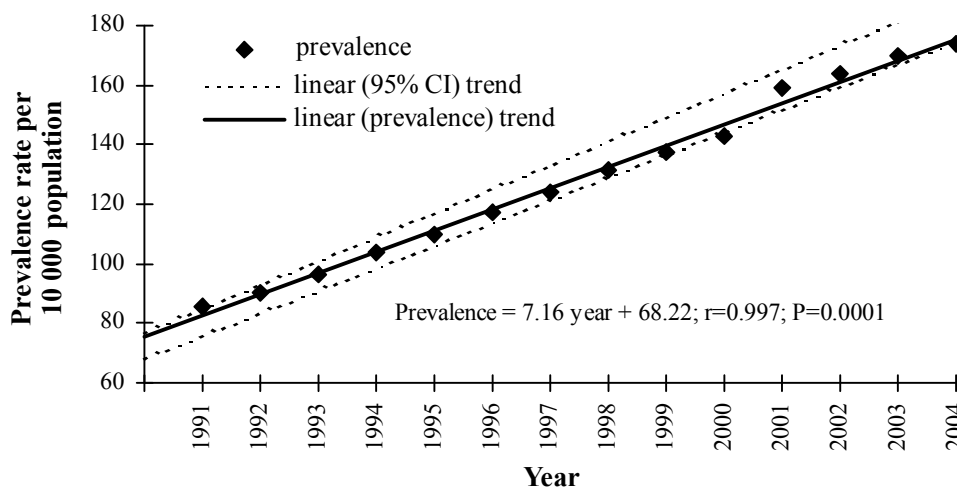


Fig. 1. Trend of type 1 diabetes mellitus prevalence among males aged more than 15 years during 1991–2004

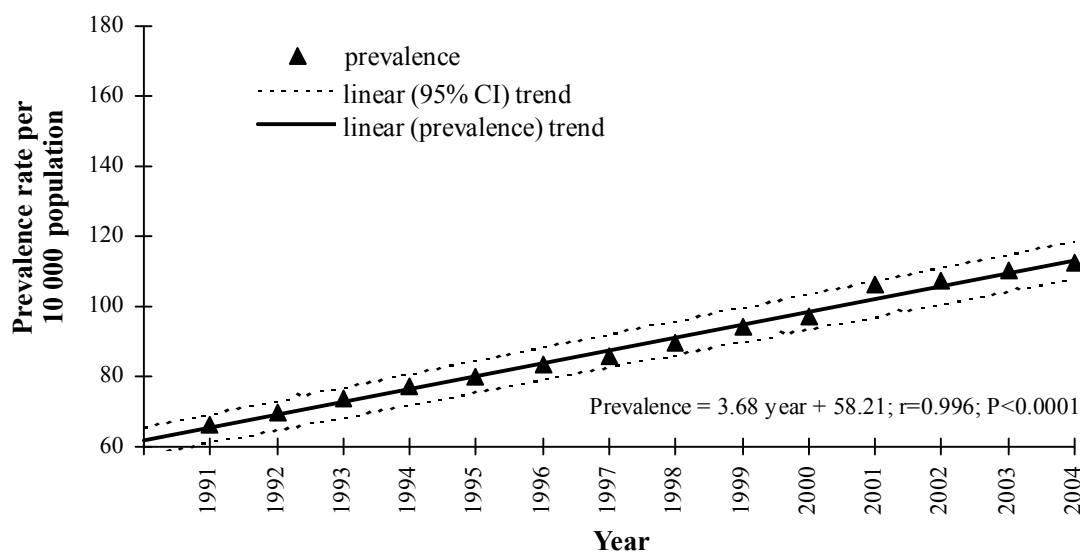


Fig. 2. Trend of type 1 diabetes mellitus prevalence among females aged more than 15 years during 1991–2004

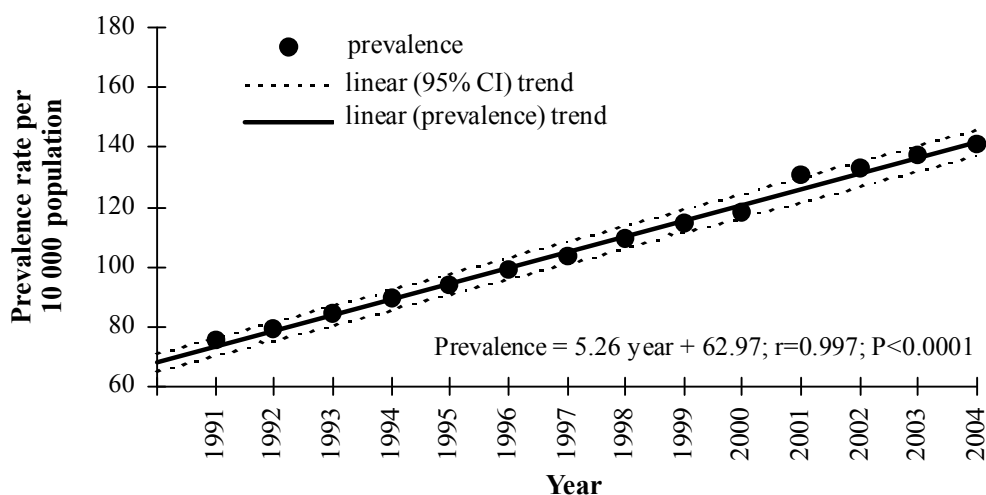


Fig. 3. Trend of type 1 diabetes mellitus prevalence among males and females aged more than 15 years during 1991–2004

adulthood and will need to be revised as soon as new and better data become available.

For effective cooperation, recording of cases was made as simple as possible regarding diagnostic procedures generally accepted in Lithuania and diagnostic criteria established by the World Health Organization. A thorough analysis of these data was complicated for older people because they not always can recall the exact date when diabetes was diagnosed and when treatment with insulin was started, and yet it is not possible to determine C-peptide levels in all our patients. The methods of case definition and ascertainment are closest to those reported by researchers of other Baltic countries such as Latvia and Estonia (15).

Estimates of the prevalence of diabetes and impaired glucose tolerance are available for 212 countries and territories, which have been allocated into one of the seven International Diabetes Federation regions: Africa, Eastern Mediterranean and Middle East, Europe, North America, South and Central America, South-East Asia, and Western Pacific (13). Most of studies were not specifically designed to assess the rates of diabetes mellitus at a national level; however, if applied cautiously, they can provide a crude substitute for these data. The ancestry of the Lithuanian population favors comparisons with those of North, Central, and East Europe. Such comparisons are of considerable value, not only for defining the descrip-

tive epidemiology of T1DM around the Europe, but also in the search for, and evaluating of, putative risk factors for the disease (13, 15, 16).

The studies on T1DM prevalence have been conducted in Africa, Australia, Canada, China, Croatia, Denmark, Finland, France, Germany, Great Britain, Italy, Iceland, Japan, New Zealand, Spain, Sweden, USA, etc. Virtually most of these studies have determined the prevalence rates of T1DM for 0–19-year age group. The prevalence of T1DM indicates a strong geographical gradient with high prevalence rates in the northern latitudes (e.g., more than 200 cases per 100 000 population in Finland) and much lower rate near equator (25 per 100 000 in Spain). The lowest prevalence rates were found in rural areas and represented areas where people are living closer to their traditional life styles (4, 13, 17–20). The male predominance among T1DM subjects was observed in North European countries, Belgium, Italy, Sweden, etc. (4, 21, 22).

Quantifying the prevalence of diabetes mellitus and the number of people affected by diabetes, now and in the future, it is important to allow rational planning and allocation of resources (10). In worldwide projections, D. McCarty and P. Zimmet projected that in Lithuania about 28 000 subjects with T1DM would be by the year 2010 (19). Our data analysis showed that by the year 2010, the expected number of children, adolescents, and adults with type 1 diabetes mellitus would be about 6000, without regarding the degree of westernization of life in Lithuania. In the future, it should become possible to prevent disease in a considerable proportion of potential cases of T1DM (23). However, it will take several years before the results of ongoing intervention trials become available, and newly emerging prevention strategies have still to be tested in large-scale, long-term, and well-planned clinical trials.

Conclusions

1. The prevalence of type 1 diabetes mellitus

among more than 15-year-aged Lithuanian females was lower than among males.

2. The register provides the possibility of highly precise collection of the data on patients from various medical care units of Lithuania.

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Pirmojo tipo cukrinio diabeto paplitimas tarp paauglių ir suaugusių Lietuvos gyventojų 1991–2004 metais

Rytas Ostrauskas

Kauno medicinos universiteto Endokrinologijos institutas

Raktažodžiai: pirmojo tipo cukrinis diabetas, registras, paplitimas, paaugliai, suaugusieji.

Santrauka. *Darbo tikslas.* Apibendrinti pirmojo tipo cukrinio diabeto paplitimo tarp 15 metų ir vyresnių Lietuvos gyventojų duomenis nuo 1991 iki 2004 metų.

Tyrimo medžiaga ir metodai. Informacija apie 16 metų ir vyresnius sergančiuosius pirmojo tipo cukriniu

diabetu surinkta iš atsakingų už diabetologinę pagalbą Lietuvos miestų ir rajonų bendrosios praktikos gydytojų, internistų ir endokrinologų. Duomenys apie penkiolikmečius pacientus gauti iš Lietuvos nacionalinio vaikų cukrinio diabeto registro.

Rezultatai. 1991 metų gruodžio 31 d. Lietuvoje buvo užregistruoti 2179 paaugliai ir suaugę sergantieji pirmojo tipo cukriniu diabetu, arba 75,21 šimtui tūkstančių gyventojų (95 proc. pasikliautinis intervalas – 72,12–78,43), o 2004 m. pabaigoje – 3996 arba 140,69 (136,40–145,12), atitinkamai. Per 14 metų sergančiųjų pirmojo tipo cukriniu diabetu kasmet padaugėjo vidutiniškai 144,85±23,32 paciento arba 4,66±1,17 proc., arba 4,04±1,19/100000 (vyrų atitinkamai – 85,54±10,82 arba 5,06±1,02 proc., arba 6,81±1,57/100000, o moterų – 54,23±9,05 arba 3,93±0,86 proc., arba 3,56±1,05/100000). Tiesinės regresijos modelis rodė 15 metų ir vyresnių sergančiųjų pirmojo tipo cukriniu diabetu paplitimo rodiklio augimo tendenciją. Standartizuoti vyrų ir moterų paplitimo rodikliai 1991 metais buvo atitinkamai – 80,64/100.000 ir 70,23/100000 ($p<0,05$), 2004 metais – 166,52 ir 117,63 ($p<0,05$).

Išvados. Pirmojo tipo cukrinio diabeto paplitimas Lietuvos populiacijoje buvo mažesnis tarp 15 metų ir vyresnių moterų nei tarp vyrų. Registro metodu iš įvairių Lietuvos gydymo įstaigų galima surinkti tikslesnę informaciją apie sergančiuosius pirmojo tipo cukriniu diabetu.

Adresas susirašinėti: R. Ostrauskas, KMU Endokrinologijos institutas, Eivenių 2, 50009 Kaunas
El. paštas: rytas.ostrauskas@med.kmu.lt, ostrausk@kaunas.init.lt

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