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Original Research Article

THE INCIDENCE RATE OF DIABETES MELLITUS AND PRE-DIABETES IN KORCA - ALBANIA, IN 2015

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Abstract

Background: The worldwide prevalence of DM has risen dramatically over the past two decades, from an estimated 30 million cases in 1985 to 285 million in 2010. Based on current trends, the International Diabetes Federation project that 438 million individuals will have diabetes by the year 2030.

Aim: The aim of this study was to evaluate the incidence rate of Diabetes Mellitus and Pre-diabetes in Korca, during 2015. **Materials and Methods**: Between January 2015 and December 2015, all consecutive individuals, referred from primary doctors in policlinic or hospital of Korca, doubting Diabetes Mellitus, were recruited and underwent diagnostic procedures. HbA_1c and/or fasting glucose and 2h postprandial glucose was used to diagnose Diabetes Mellitus and Pre-diabetes. The C Peptide was measured to diagnose type 1 from other types of Diabetes. Clinical and laboratory data were collected. A register of new-diagnosed Diabetic individuals was opened. **Results**: 288 people were newly diagnosed with type 2 diabetes mellitus; 4 people were diagnosed with type 1 diabetes; 4 people with pre-diabetes (Impaired glucose tolerance); and 4 people with secondary forms of diabetes. The incidence of type 2 diabetes mellitus was 144/100,000 per year. The incidence of type 1 diabetes mellitus was 2/100,000 per year. The incidence rate of pre-diabetes and secondary forms of diabetes was 2/100,000 per year respectively. The most affected age was 60-69.No difference in incidence between men and women in type 2 diabetes. According time at diagnoses the most frequent months were April and December. **Conclusion**: The incidence rate of type 2 diabetes mellitus was 144/100,000 per year. The incidence rate of type 1 diabetes mellitus was 2/100,000 per year. The incidence rate of pre-diabetes and secondary forms of diabetes were 2/100,000 per year respectively.

Key words: Diabetes Mellitus, Pre-diabetes, Impaired glucose tolerance, Secondary forms of diabetes, Incidence rate.

Introduction:

Diabetes Mellitus (DM) refers to a group of common metabolic disorders that share the phenotype of hyperglycemia. Depending on the etiology of the DM, factors contributing to hyperglycemia include reduced insulin secretion, decreased glucose utilization, and increase glucose production. The metabolic dysregulation associated with DM causes secondary pathophysiologic changes in multiple organ systems that impose a tremendous burden on the individual with diabetes and on health care system. In the United States DM is the leading cause of end-stage renal disease (ESRD), non traumatic lower extremity amputation, and adult blindness. It also predispose to cardiovascular diseases. With an increasing incidence worldwide, DM will be a leading cause of morbidity and mortality for the foreseeable future. The worldwide prevalence of DM has risen dramatically over the past two decades, from an estimated 30 million cases in 1985 to 285 million in 2010. Based on current trends, the International Diabetes Federation project that 438 million individuals will have diabetes by the year 2030. Although the prevalence of both type 1 and type 2 DM is increasing worldwide, the prevalence of type 2 DM is rising much more rapidly, presumably because of increasing obesity, reduced activity levels as countries become more industrialized, and aging of the population. In 2010 the prevalence of DM ranged from 11.6% to 30.9% in the 10 countries with the highest prevalence (Naurua, United Arab Emirates, Saudi Arabia, Kuwait, Oman, Tonga, and Malaysia). Approximately 1.6 million individuals (>20 years) were newly diagnosed with diabetes in 2010 in United States of America. In 2010, the prevalence of DM in the United States was estimated to be 0.2% in individuals aged <20 years and 11.3% in individuals aged >20 years. In individuals aged >65 years, the prevalence of DM was 26.9%.The prevalence is similar in men and woman through-out most age ranges (11.8 and 10.8% respectively, in individuals aged >20 years). Worldwide estimates project that in 2030 the greatest number of individuals with diabetes will be aged 45-64 years.

There is considerable geographic variation in the incidence of both type 1 and type 2 DM. Scandinavia has the highest incidence of type 1 DM. The Pacific Rim has a much lower rate of type 1 DM (in Japan and China, the incidence is 0.6-2.4/100,000 per year); Northern Europe and United States have an intermediate rate (8-20/100,000 % per year). The prevalence of type 2 DM and IGT is highest in certain Pacific islands and in the Middle East and intermediate in countries such as India and the United States. This variability is likely due to genetic behavioral and environmental factors. DM prevalence also varies among different ethnic populations within a given country. Diabetes is a major cause of mortality. In United States, diabetes was listed as the seventh leading cause of death in 2007; a recent estimate suggested that diabetes was the fifth leading cause of death worldwide and was responsible for almost 4 million deaths in 2010(6.8% of deaths were attributed to diabetes worldwide).(1)

Materials and Methods:

Patients

Between January 2015 and December 2015, all consecutive individuals, referred from primary doctors in policlinic or hospital of Korca, doubting Diabetes Mellitus, were recruited and underwent diagnostic procedures. The majority of these individuals with or without clinical symptoms were self-referred for a medical examination to rule out diabetes mellitus. Other participants were patients referred from their physicians for further examinations in the context of clinical

suspicion of diabetes mellitus (polyuria, polydipsia, weight loss), in order to rule out diabetes mellitus.

Table 1.

Criteria for the diagnosis of Diabetes Mellitus:

- Symptoms of Diabetes Mellitus plus random blood glucose concentration≥11.1mmol/L (200mg/dl) or
- Fasting plasma glucose ≥7.0mmol/L (126mg/dl) or
- A1c≥6.5%[c] or
- Two-hour plasma glucose≥11.1mmol/L (200mg/dl) during an oral glucose tolerance test

- Random is defined as without regard to time since the last meal.
- Fasting is defined as no caloric intake for at least 8 hours.
- The test should be performed in a laboratory certified according to A1C standards of Diabetes Control and Complication Trials.
- The test should be performed using a glucose load containing the equivalent of 75g anhydrous glucose dissolved in water, not recommended for routine clinical use.

Note: In the absence of unequivocal hyperglycemia and acute metabolic decompensation, these criteria should be confirmed by repeat testing on a different day

Source: American Diabetes Association: Diabetes Care 34:S11, 2011, (2).

HbA_1c and/or fasting glucose and 2h postprandial glucose was used to diagnose Diabetes Mellitus and Pre-diabetes. The C Peptide was measured to diagnose type 1 from other types of diabetes, (values of C Peptide < 0.2 μg/L were referred to as type 1 diabetes). Clinical and laboratory data were collected. A register of new-diagnosed Diabetic individuals was opened.

Statistical analysis

To express diabetes frequency, we used the incidence rate. The incidence rate is calculated by dividing the number of new cases of diabetes in Korca, by the number of non diabetic individuals residents during the 12 months of 2015, multiplied for 100 000. (3).

Results

During the one-year study, 288 people were newly diagnosed with type 2 diabetes mellitus; 4 people were diagnosed with type 1 diabetes; 4 people with pre-diabetes (Impaired glucose tolerance); and 4 people with secondary forms of diabetes. The incidence rate of type 2 diabetes mellitus was 144/100,000 per year. The incidence rate of type 1 diabetes mellitus was 2/100,000 per year. The incidence rate of pre-diabetes and secondary forms of diabetes was 2/100,000 per year respectively. Of those with type 2 diabetes ,144 were female and 144 male. All of those with type 1 diabetes were male. Of those with Pre-diabetes and Secondary forms of diabetes the number of females was equal to the number of males. There was no significant difference between male and female, in all types of diabetes, Figure no.1. The mean age of diagnosed people was 59 ± 12 (SD) years of age. The most affected age was 60-69 (40% of new cases), followed by age 50-59 (27% of new cases), and over 70 years of age (22% of new cases),Figure no. 2. According time at diagnoses the most frequent period were April and December, Figure no.3.

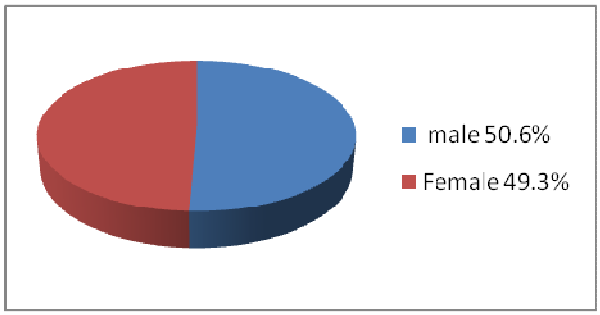

Figure 1. Sex ratio in newly diagnosed people with diabetes (all types).

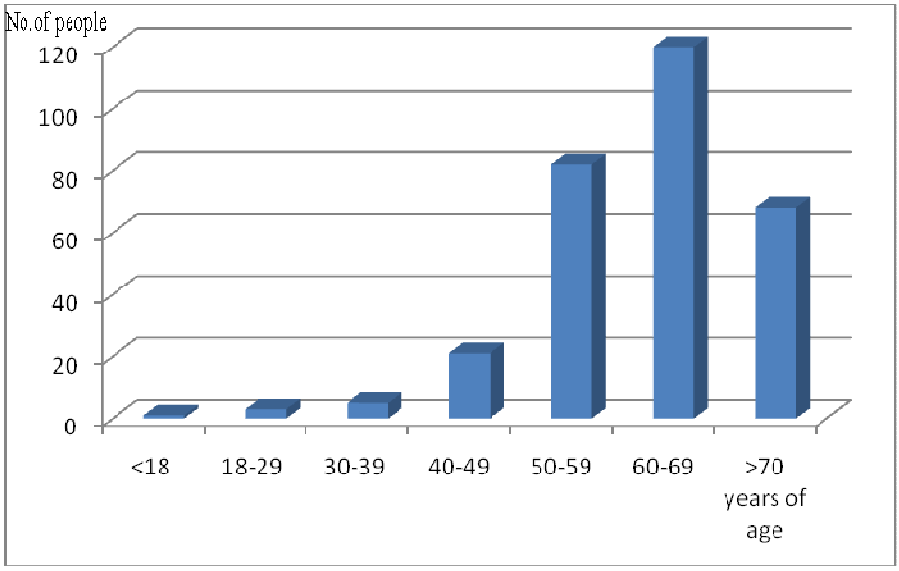

Figure 2.Incidence of Diabetes Mellitus (all types), according age.

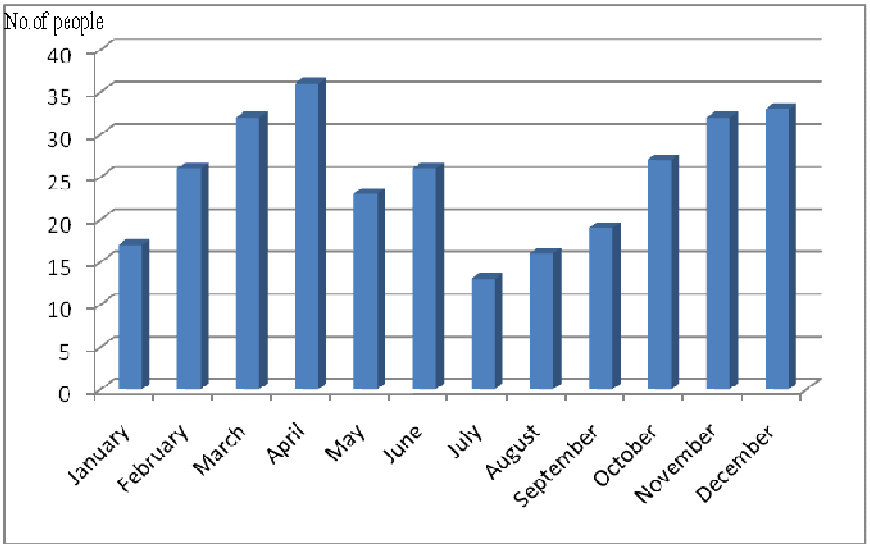

Figure 3. Incidence of Diabetes Mellitus (all types), according time (month) of diagnosis.

Discussion

1- In our study the incidence rate of type 2 diabetes was 144/100,000 per year, and that of type 1 was 2/100,000 per year . Type 2 diabetes was the predominant form of diabetes with 96% of new cases. Type 1 accounts only 1.3% of new cases. Pre-diabetes and Secondary forms of diabetes each with 1.3% . This result complies with the fact that Type 2 diabetes ,or non-insulin-dependent- diabetes (NIDDM),is one of the most common metabolic disorders affecting humans(4-5). Diabetes Mellitus type 2 is the most common form of diabetes(6). Type 1 diabetes accounts for only 10-15% of all diabetes cases(7). But the incidence of both type 1 and 2 diabetes, in our study, was lower than in large urban cities(8-9-10).

2- In our study the mean age of diagnosed people with type 2 diabetes was 59 ± 12(SD) years of age. The most affected age with type 2 diabetes was the age-group 60-69 (40% of new cases), followed by the age-group 50-59 (27% of new cases), and the age-group over 70 (22% of new cases). Compared with the age-group 30-39, the risk increased fivefold higher in the age-group 40-49 , sixteen fold higher in the age-group 50-59 and twenty-four fold higher in the age-group 60-69, irrespective of sex. Our finding is, as in other studies, which the incidence increased significantly across categories of age (11-12). The development of diabetes type 2 is profoundly influenced by attained age. For example, in the 1960s in the white population of Rochester, Minnesota, the incidence of type 2 diabetes increased from 10 per 100,000 to 612 per 100,000 person-years, respectively, for individuals aged 20 to 29 and 60 to 69years(8-9-10).

3-In our study the mean age of diagnosed people with type 1 diabetes was 21± 9.4 (SD). The mean age was higher compared with other data(7). Based on disease registers and recent studies, the annual number of new cases of Type 1 diabetes in children aged under 15 years is high at 25 or more per 100 000 population in Nordic countries (Finland, Norway and Sweden).Bulgaria, Croatia and Switzerland have less than ten new cases per 100 000 population(7).

4-In our study there was no difference in incidence between men and women with type 2. The rate of occurrence was 1:1. In contrast with that, in type 1diabetes all subjects were males. With regard to gender differences, there are no solid data to suggest that the prevalence of diabetes differs by gender per se. The study of Polynesians that shows a sevenfold higher rate of diabetes in women than in men seems to be explained by their clear differences in physical activity (13). In other studies male subjects are found to have higher risks than female subjects for both type-1 and 2 diabetes (12).

5-In our study, the new cases with diabetes were diagnosed more frequently in April and December. There are few data to compare regarding the period of time in which the diabetes is mostly diagnosed.

Conclusion

The incidence of type 2 diabetes mellitus was 144/100,000 per year. The incidence of type 1 diabetes mellitus was 2/100,000 per year. The incidence of pre-diabetes and secondary forms of diabetes was 2/100,000 per year respectively. The most affected age with type 2 diabetes, was the age-group 60-69, (40% of new cases). The incidence increased significantly with increasing age. No difference in incidence between men and women with type-2.

The incidence rate is the most informative measure of the frequency of diabetes in a population for the study of etiologic factors. For the computation of the incidence rate, new cases of diabetes must be recognized and counted. Type-1 diabetes is easily recognized, and virtually all new cases are

ascertained in a society with access to medical care. Recognition of new cases of type 2 diabetes, however, depends on the severity of symptoms, diagnostic activity of the medical-care system, and the choice of diagnostic criteria (14-15).

Furthermore we need to evaluate the BMI, the life style, and other risk factors for the diabetes, in order to improve the study, and to encourage the government to improve local diabetes monitoring and prevention strategies. We also need to calculate the incidence rate according age and sex, as a specific rate.(3-16).

References

[1] Alvin C. Powers (2012) CH 344 Diabetes Mellitus, Harrison's text book of internal medicine., Mc Graw Hill's pub Vol. 2,18th edition ,pg no 2968.

[2] American Diabetes Association: Diabetes Care 34:S11, 2011.

[3] Calculating a Rate It is customary to use rates per 100,000 https://www.stats.indiana.edu/vitals/CalculatingARate.pdf.

[4] Warram JH, Rich SS, KrolewskiAS, Epidemiology and genetics of diabetes mellitus. In Khan CR, Weir G, eds. Joslin's Diabetes Mellitus, 13'th ed.Philadelphia:Lea & Febiger, 1994:201-215.

[5]Mokdad AH, Ford ES, Bowman BA, et al.Diabetes trends in the US:1990-1998. *Diabetes Care* 200;23:1278-1283.

[6] Rosenbloom Al, Joe JR, Young RS, et.al. Emerging epidemic of type 2 diabetes in youth. Diabetes Care 1999;22:345-354.

[7] OECD (2012), "Diabetes prevalence and incidence", in Health at a Glance: Europe 2012, OECD Publishing. http://dx.doi.org/10.1787/9789264183896-17

[8] Vanderpump MP, Tunbridge WM, French JM,et al. The incidence of diabetes mellitus in an English community: a 20-year follow-up of the Whickham Survey.*Diabet Med* 1996; 13:741-747

[9] Vilbergson S, Siggurdson G, Sigvaldason H,et al, Prevalence and incidenceof NIDDM in Iceland: evidence for stable incidence among males and females1967-1991-the Reykjavik study. .*Diabet Med* 1997; 14:491-498.

[10] James H. Warram and Andrzej S.Krolewski, Joslin's Diabetes Mellitus, 14'th edition, Epidemiology of Diabetes Mellitus, Chapter 20,Variation in Ocurrence of type 2 Diabetes according Age, pg no 346.

[11]Prevalence of Diabetes among Men and Women in China N Engl J Med 2010; 362:1090-1101March 25, 2010DOI: 10.1056/NEJMoa0908292

[12] Population-Based Incidence Rates and Risk Factors for Type 2 Diabetesin White Individuals The Bruneck Study, Prof. Enzo Bonora, doi:10.2337 /diabetes.53.7.1782Diabetes July 2004 vol. 53 no. 71782-1789.

[13] Fujimoto WF Diabetes in Asians and Pacific Isander Americans. In:National Diabetes Data Group. *Diabetes in America*, 2nd ed. Bethesda, MD. National Institute of Diabetes and Digestive and Kidney Diseases, 1995:661-681. NID-DKD publication 95-1468.

[14] Harris MI, Eastman RC, Cowie CC, et al. Comparison of diabetes diagnostic categories in the U.S. population, according to 1997 American Diabetes Associations and 1980-1985 World Health Organization diagnostic criteria. *Diabetes care* 1997; 20:1859-1862.

[15] James H. Warram and Andrzej S. Krolewski, Joslin's Diabetes Mellitus, 14'th edition, Epidemiology of Diabetes Mellitus, Chapter 20,Diferences in distribution of type 1 and 2 of diabetes, pg no 342.

[16]James H. Warram and Andrzej S. Krolewski, Joslin's Diabetes Mellitus, 14'th edition, Epidemiology of Diabetes Mellitus, Chapter 20, Prevalence, Incidence rate and Cumulative Incidence, pgno 341.