

DIABETES PREVALENCE IN ALBANIAN ADULT POPULATION.

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ABSTRACT

Aim: Albania is undergoing deep reforms since the collapse of communism. Besides the reorganization of state structures the country is experiencing deep transformations in terms of lifestyle and other population characteristics, which implicates the emerging and potentiation of risk factors for diabetes. Our aim was to assess the prevalence of diabetes in the changing adult population of Tirana.

Methods: A cross-sectional survey was carried out in Tirana in 2012 involving a representative sample of 850 adults aged 18 years or older. Information regarding basic socio-demographic and socioeconomic factors, as well as data regarding the presence of diabetes mellitus were collected via face-to-face interviews using a structured questionnaire.

Results: The overall prevalence of diabetes was 11.5%. Diabetes prevalence was significantly higher among older subjects (18.6%) compared to younger ones (2.3%), among those with lower education (20.9%) compared to highly educated persons (6.9%) and it was negatively and significantly associated with income level and social status.

Conclusions: This survey provided recent information regarding the prevalence of diabetes and its distribution according to socio-demographic and socioeconomic factors in Albania. Diabetes prevalence is increasing thus reflecting the trends of risk factors. Immediate measures should be taken to prevent diabetes and control its complications through education in order to alleviate its burden on individuals and society as a whole.

Keywords: Albania, diabetes, socioeconomic status, Tirana.

Introduction

The number of people living with diabetes is rising in every country and half of people with diabetes are not aware that they suffer from type 2 diabetes (1), which comprises around 90% of all diabetes cases (2). Diabetes is associated with significant concerns to the health of the individuals and also poses a tremendous burden to the health systems of any nation as the expenses related to direct and indirect costs of diabetes take away major amounts of money (1, 3-4) which could be used for other public health or health improvement efforts. The prevalence of diabetes is different in different parts of the world, ranging from 4.3% in Africa up to 10.9% in Middle East and North Africa among people aged 20-79 years in 2012 (1). Diabetes prevalence is associated with a number of socio-demographic and socio-economic factors, such as age, education, occupational status and income (5). Diabetes has been studied extensively in USA, Europe and Asia (6-8) but data for Albania are still limited and, in the best of cases, contradictory. A study in 2001 among Tirana adults revealed that the prevalence of diabetes was 6.3% (9) among adults aged 25 years or older and one third of diabetics didn't know that they had the condition. Another study among people aged 65 years or older conducted in Albania in 2007-2008 reported the prevalence of diabetes at 18.7% (10). The prevalence of diabetes was found to be 4.2% in 2006 among 3709 volunteers in southwest Albania (11). According to the International Diabetes Federation, the prevalence of diabetes was estimated to be at 4.8% in 2007 and 7.5% in 2025 (12). At a recent conference presentation, it was stated that the prevalence of diabetes in Albania has more than doubled during 1990-2010 and the figure is on the rise, mainly due to the aging of the population, urbanization process, changes in lifestyle including obesity and physical inactivity (13).

In this context, the aim of our study was to assess the prevalence of diabetes in a representative sample of adults in Tirana, Albania.

Methodology

A cross-sectional study was conducted in Tirana in April-July 2012 including a representative sample of 845 individuals aged ≥ 18 years (500 women, mean age: 49.7 ± 18.8 years; 345 men, mean age: 51.3 ± 18.4 years).

Data on socio-demographic and socioeconomic factors as well as information about other lifestyle factors (feeding habits regarding fruit, vegetables, meat, sweets and salt consumption frequencies) were collected via face-to-face interviews. Education years were recoded into a three category variable: *low* (0-8 years of education); *middle* (9-12 years of education) and *high* (≥ 13 years of education). Age was categorized into three categories: *18-35 years*, *36-50 years* and *>50 years*. The respondents self-reported information about their social status into three categories: *low*, *middle* and *high*. Finally, the employment status comprised these categories: *employed*, *unemployed*, *student* and *retired*. The data collection tool comprised a structured questionnaire. We also measured the anthropometric indices such as weight, height and waist and hip circumferences.

To estimate the prevalence of diabetes, the participants were asked the following question: "Has a doctor ever told you that you have diabetes?". If a participant would answer "Yes" to this question, another question would follow: "If Yes, how do you treat it?" with the answering options being: "by special diabetic diet" and "by medicaments". The persons answering "by medicaments" could then detail what kind of medicaments they were using to control their diabetes. In addition to ask the subjects about their own diabetes, they were also asked to provide some information about their family history about diabetes. In this regard, all the participants were asked the following question: "Do you think your mother, and/or father, and/or your sisters or brothers have had or have diabetes?".

Chi-square test was used to compare differences in diabetes prevalence levels between different socio-demographic and socioeconomic groups of study participants. A p-value of ≤ 0.05 was

regarded as statistically significant. Spearman's rho coefficient was used to assess the direction and the strength of the bivariate associations between diabetes prevalence with socio-demographic and socio-economic variables. Statistical Package for Social Sciences (SPSS), version 15.0, was used for all the statistical analyses

Results

Overall, 95 respondents were ever told by a doctor that they had diabetes. Therefore, the overall prevalence of diabetes in our sample was 11.5%. Among those who had diabetes, 12.5% treated it by using special diabetic diet whereas the remaining 87.5% of respondents treated it by using different medicaments. About 80% of diabetic persons who were using medicaments to control their diabetes reported to be using different glucose lowering drugs whereas the remaining 20% reported to use insulin to keep their glucose level under control. As regards the family history for diabetes, 12% of the respondents mentioned that their mother has or has had diabetes, 10% reported their father to have diabetes and 12.1% said that at least one of their brothers or sisters experienced diabetes (data not shown).

The prevalence of diabetes was similar among men and women: 12.3% of men and 11.0% of women reported to have diabetes, and the difference is not statistically significant ($P=0.559$). Individuals belonging to the oldest age-group reported significantly higher rates of diabetes compared to their younger counterparts belonging to 18-35 and 36-50 years age-groups: 18.6% vs. 2.3% and 5.8%, respectively ($P<0.001$). Diabetes prevalence was significantly lower among highly educated individuals, 6.9% of whom reported to have diabetes and higher among low educated individuals among whom the prevalence was 20.9% ($P<0.001$). Diabetes prevalence was negatively associated with the income level: the frequency of the disease was significantly higher among lower income level individuals compared to higher income level individuals: the prevalence of diabetes was 17.7% among low income level individuals vs. 7.5% among high income level individuals and this difference showed to be of borderline significance ($P=0.042$). A similar negative but significant association between diabetes prevalence and social status was noticed (see Table1) with the disease being more prevalent among lower social status individuals ($P=0.043$).

Table 1. Distribution of self-reported diabetes by socio-demographic characteristics

Variable	Has a doctor ever told you that you have diabetes?			
	Total	Yes	No	P-value
Sex:				
Men	334 (100.0)*	41 (12.3)	293 (87.7)	0.559
Women	493 (100.0)	54 (11.0)	439 (89.0)	
Age-group:				
18-35 years	222 (100.0)	5 (2.3)	217 (97.7)	<0.001
36-50 years	138 (100.0)	8 (5.8)	130 (94.2)	
>50 years	435 (100.0)	81 (18.6)	354 (81.4)	
Educational level:				
Low	134 (100.0)	28 (20.9)	106 (79.1)	<0.001
Middle	311 (100.0)	39 (12.5)	272 (87.5)	
High	347 (100.0)	24 (6.9)	323 (93.1)	
Income level:				
Low	96 (100.0)	17 (17.7)	79 (82.3)	0.042
Middle	512 (100.0)	61 (11.9)	451 (88.1)	
High	173 (100.0)	13 (7.5)	160 (92.5)	
Social status:				
Low	88 (100.0)	15 (17.0)	73 (83.0)	0.043
Middle	627 (100.0)	75 (12.0)	552 (88.0)	
High	59 (100.0)	2 (3.4)	57 (96.6)	
Employment status:				
Employed	336 (100.0)	15 (4.5)	321 (95.5)	<0.001
Unemployed	156 (100.0)	15 (9.6)	141 (90.4)	
Students	62 (100.0)	1 (1.6)	61 (98.4)	
Retired	256 (100.0)	62 (24.2)	194 (75.8)	

* Number of individuals and row percentages (in parenthesis). Discrepancies in totals are due to missing values.

In bivariate correlations, diabetes was positively and significantly associated with education and the association is moderate (Spearman's $\rho=0.232$, $P<0.01$) whereas it was negatively associated with education (Spearman's $\rho=-0.151$, $P<0.01$), with social status (Spearman's $\rho=-0.087$, $P<0.05$) and income level (Spearman's $\rho=-0.089$, $P<0.05$).

Discussion

This study provides recent information regarding the prevalence of diabetes in the urban adult population of Albania and its distribution across socio-demographic and socioeconomic factors. The prevalence of diabetes in our study was 11.5%, which is relatively higher compared to other figures reported by previous studies. A study conducted more than a decade ago reported a prevalence of 6.3% among adults aged 25 years and older (9). This is clearly lower than the 2012 prevalence reported by us. The discrepancies could be attributed to many factors, including changes in lifestyle with clear trends towards increasing of the prevalence of diabetes risk factors (13) such as: overweight and obesity rates (14-15), increasing rates of physical inactivity (14,16), increasing rates of alcohol (17) and tobacco use (18) during a 12 years' time span. Another source which might explain this discrepancy could be routed in the different definitions of plasma glucose cut-off points that indicate diabetes mellitus, used in both studies. For example, the 2001 study by Shapo et al. considered as diabetics all persons having a fasting plasma glucose level of ≥ 7.8 mmol/L whereas recently the guidelines indicate the level of ≥ 7 mmol/L as a threshold for diabetes mellitus (19). Therefore, the discrepancy between the reported prevalence could be partly attributed to artifacts. The study among persons aged 65 years or older in Albania reported a higher prevalence rate of diabetes, which is explainable by the positive relationship that exists between diabetes prevalence and age (9,20) found in our study as well. The associations of diabetes prevalence with the educational level, income level, social status and

occupational status are in concordance with previous studies (5-6).

There is now grounded evidence that obesity is becoming an issue of increasing concern to the Albanian health system, as in other parts of the world (1, 3-4). It is clear that socioeconomic inequalities could boost the burden of diabetes across certain population groups. Determined and well-guided efforts are needed in order to reduce such disparities in the Albanian population. Since all things are interconnected, then, let's say, measures to improve and enhance the education of the people will have an effect on their income and finally this could affect the prevalence of diabetes as well. From the public health perspective, urgent measures need to be taken in order to prevent diabetes mellitus and its complications, especially in the context of booming of diabetes' risk factors due to changes in life-style in our country. Since type 2 diabetes has strong, modifiable non-genetic components, then changes in life-style could result in major benefits in terms of disease prevention (21) and prevention of complications among those already living with the disease (22-23).

A potential methodological limitation could arise from the sample study. Our sample is representative of the urban adult population of Tirana aged 18 years or older and therefore the representativeness for the whole Albanian population of this age-group is not guaranteed. However, since Tirana represents a wide mix of sub-cultures and population groups arrived from all parts of Albania then caution inference could be feasible. A strong aspect of the present survey is the nature of the information collected. We asked the participants to answer about their education years, age, and occupation, which are all easy to be remembered and there is little room for information bias.

In summary, diabetes prevalence is high in Albania and, confronting with other data sources, it is increasing. The disease is more frequent among least educated, among older people and among those with lower income level. It is necessary to take the appropriate preventive measures in order to alleviate the burden of diabetes in Albania.

References

1. International Diabetes Federation. IDF Diabetes Atlas. 5th edition, 2012. Available at: <http://www.idf.org/diabetes-atlas-2012-update-out-now>. Last accessed: November 2012.
2. World Health Organization. 10 Facts about diabetes. November 12. Available at: <http://www.who.int/features/factfiles/diabetes/en/index.html>. Last accessed: November 2012.
3. American Diabetes Association. Economic consequences of diabetes mellitus in the US in 1997. *Diabetes Care*. 1998;21:296-309.
4. Asche CV, Bode B, Busk AK, Nair SR. The economic and clinical benefits of adequate insulin initiation and intensification in people with type 2 diabetes mellitus. *Diabetes Obes Metab*. 2012; 14(1):47-57.
5. Robbins JM, Vaccarino V, Zhang H, Kasl SV. Socioeconomic status and diagnosed diabetes incidence. *Diabetes Res Clin Pract*. 2005; 68(3):230-6.
6. Espelt A, Borrell C, Roskam AJ, Rodríguez-Sanz M, Stirbu I, Dalmau-Bueno A, Regidor E, Bopp M, Martikainen P, Leinsalu M, Artnik B, Rychtarikova J, Kalediene R, Dzurova D, Mackenbach J, Kunst AE. Socioeconomic inequalities in diabetes mellitus across Europe at the beginning of the 21st century. *Diabetologia*. 2008; 51(11):1971-9.
7. Gregg EW, Cadwell BL, Cheng YJ, Cowie CC, Williams DE, Geiss L, Engelgau MM, Vinicor F. Trends in the prevalence and ratio of diagnosed to undiagnosed diabetes according to obesity levels in the U.S. *Diabetes Care*. 2004; 27(12):2806-12.
8. Yoon KH, Lee JH, Kim JW, Cho JH, Choi YH, Ko SH, Zimmet P, Son HY. Epidemic obesity and type 2 diabetes in Asia. *Lancet*. 2006; 368(9548):1681-8.
9. Shapo L, McKee M, Coker R, Ylli A. Type 2 diabetes in Tirana City, Albania: a rapid increase in a country in transition. *Diabet Med*. 2004; 21(1):77-83.
10. Ylli A. Health and Social Conditions of Older People in Albania: Baseline Data from a National Survey. *Public Health Reviews* 2010; 2:549.
11. Doupis J, Tentolouris N, Mastrokostopoulos A, Kokkinos A, Doupis C, Zdrava A, Kafantogias A. Prevalence of type 2 diabetes in the southwest Albanian adult population. *Rural and Remote Health* 2007; 7:744. (Online). Available: <http://www.rrh.org.au>.
12. Andricic C. Country report for Albania. International Diabetes Federation. 2008. Available at: <http://www.idf.org/webdata/docs/idf-europe/Country%20report%20for%20ALBANIA%20pub.pdf>. Last accessed: October 2012.
13. Toti F, Golay A, Bejtja G. Increased prevalence of obesity and type 2 diabetes in Albanian population. Geneva Health Forum: A critical shift to chronic conditions: learning from the frontliners. April 18-20, 2012. Available at: <http://www.ghf12.org/?p=3038>. Last accessed: November 2012.
14. Shapo L, Pomerleau J, McKee M, Coker R, Ylli A. Body weight patterns in a country in transition: a population-based survey in Tirana City, Albania. *Public Health Nutr*. 2003; 6(5):471-7.
15. Spahija B, Qirjako G, Toçi E, Roshi E, Burazeri G. Socioeconomic and lifestyle determinants of obesity in a transitional southeast European population. *Med Arh*. 2012; 66(3 Suppl 1):16-20.
16. Burazeri G, Goda A, Kark JD. Television viewing, leisure-time exercise and acute coronary syndrome in transitional Albania. *Prev Med* 2008; 47:112-115
17. Burazeri G, Kark JD. Alcohol intake and its correlates in a transitional predominantly Muslim population in southeastern Europe. *Addict Behav*. 2010; 35(7):706-13.

18. Ross H, Zaloshnja E, Levy DT, Tole D. Results from the Albanian Adult Tobacco Survey. *Cent Eur J Public Health*. 2008; 16(4):182-8.
19. Fauci AS, Braunwald E, Kasper DL, Hauser SL, Longo DL, Jameson JL, Loscalzo J. *Harrison's principles of internal medicine*. 17th edition. McGraw-Hill; 2008:2275.
20. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. *Diabetes Care*. 2004; 27(5):1047-53.
21. Tuomilehto J, Lindström J, Eriksson JG, Valle TT, Hämäläinen H, Ilanne-Parikka P, Keinänen-Kiukaanniemi S, Laakso M, Louheranta A, Rastas M, Salminen V, Uusitupa M; Finnish Diabetes Prevention Study Group. Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *N Engl J Med*. 2001; 344(18):1343-50.
22. Funnell MM, Brown TL, Childs BP, Haas LB, Hoseney GM, Jensen B, Maryniuk M, Peyrot M, Piette JD, Reader D, Siminerio LM, Weinger K, Weiss MA. National standards for diabetes self-management education. *Diabetes Care*. 2012;35 Suppl 1:S101-8.
23. Garber AJ. Obesity and type 2 diabetes: which patients are at risk? *Diabetes Obes Metab*. 2012;14(5):399-408.