

Original article

Type 2 diabetes mellitus in France in 2012: Results from the ObEpi survey

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Abstract

Aim. – This analysis estimates the prevalence of type 2 diabetes mellitus (T2DM) in French adults participating in the ObEpi (obesity epidemiology) 2012 survey and also proposes a description of that population, according to comorbidities, treatments and sociodemographic factors related to the disease.

Methods. – A self-administered questionnaire was posted to 20,000 households from the Kantar Health panel. In total, 25,714 adults aged ≥ 18 years and representative of the French population completed the survey between January and March 2012.

Results. – The prevalence of T2DM was $5.5 \pm 0.3\%$ (95% CI) in this representative sample of the adult French population. Average age of patients was 65.9 years; 55% were men. Mean body mass index was 29.9 kg/m^2 (men: 29.4 kg/m^2 , women: 30.6 kg/m^2 ; $P < 0.01$); the prevalence of obesity was 43.1% (men: 39.9%, women: 47.1%; $P < 0.01$). Patient-reported treatments for comorbidities were frequent: high blood pressure, 59.1%; dyslipidaemia, 59.9%; myocardial infarction/angina pectoris, 9.7%; revascularization, 7.8%; heart failure, 7.4%; sleep apnoea, 8.3%; and osteoarthritis, 10.7%. With regards to known treatments, 81.4% of patients were taking oral antidiabetic drugs (OADs), and 15.3% were using insulin therapy. Also, 18.8% of diabetic respondents reported financial hardship.

Conclusion. – T2DM remains a disease of major concern: compared with the non-diabetic population, all parameters surveyed showed unfavourable ratings, particularly for women.

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Keywords: Type 2 diabetes mellitus; Epidemiology; Prevalence; Comorbidity; Treatment

1. Introduction

The global prevalence of diabetes has seen a constant increase over recent decades. The number of people worldwide with the disorder has almost doubled, from 153 million in 1980 to 347 million in 2008 [1]. In 2011, diabetes became the leading long-term disease in France, with 1,885,382 cases, exceeding the 1,861,113 cases of cancers. This was the largest increase

seen in 2010 (+6.5%), ahead of that for cardiovascular diseases (+5.3%) [2].

The vast majority of cases of diabetes mellitus are type 2 (T2DM). This is a result of the increasing prevalence of obesity [3–5] due to changes in lifestyle [6] and diet [7]. A sound understanding of the epidemiology of T2DM is therefore required, as this metabolic disorder can benefit from public policies of prevention.

Different approaches have been used to provide regular updates of the prevalence of diabetes, with analyses of its comorbidities and context of evolution. The public-health dimension of the disease has been the main concern of several campaigns in France conducted by the national health insurance fund (Caisse primaire d'assurance maladie des travailleurs salariés,

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CNAMTS) [8–10]. A number of epidemiological studies have addressed different issues, such as quality of care and management of associated cardiovascular risks [11], complications of diabetes [12], and patients' perception of the disease and its impact on daily life [13].

The obesity epidemiology (ObEpi) surveys comprise six datasets recording the prevalence of obesity in the French population between 1997 and 2012. The data were collected every 3 years using the same methodology. In the ObEpi 2012 survey, the questionnaire included new questions regarding ongoing treatments for cardiovascular disease, dyslipidaemia and diabetes, and revealed that the prevalence of known T2DM is 2.2% in people of normal weight, 6.9% in overweight people and 16.0% in the obese population [14]. Detailed analyses of these data for the treatment of diabetes is of interest in light of the recent position statement of the American Diabetes Association (ADA) and European Association for the Study of Diabetes (EASD) [15].

The primary objective of the present analysis was to estimate the prevalence of known T2DM in the general adult French population. Secondary objectives were to describe the associated comorbidities, treatments and sociodemographic factors related to the disease.

2. Methods

The ObEpi epidemiological surveys evaluated the prevalence of overweight and obesity in the French population every 3 years since 1997. The present analysis describes the population participating in the ObEpi 2012 survey (conducted in France between January and March 2012) that was treated for T2DM with hygiene and dietary measures and/or medical treatment.

2.1. Study sample

The Kantar Health polling institute mailed out questionnaires to a sample of 20,000 households from its permanent database (TNS Sofres). A household was defined as family members living under the same roof or people living on their own. Those living in residential institutions and homeless people were excluded. The sample population was determined using the quota-sampling method after double stratification by region/residence and was representative of the French population, based on the distribution of the closest national references for age, gender, occupational class, region and size of city of residence from the National Institute of Statistics and Economic Studies (Institut national de la statistique et des études économiques, INSEE). The permanent sample was adjusted by the inclusion of 550 new households each month to replace 550 households withdrawn because of repeated non-responses (75%), lack of willingness of participants (17%) or exceeding the 10-year lifetime limit in the sample (8%). The study sample was made up of volunteers who agreed to answer a number of questions.

2.2. Data collection

In addition to major questions pertaining to gender, age, profession and income, respondents were asked to specify their weight, height and ongoing medical treatment for diabetes, high blood pressure and dyslipidaemia (excess cholesterol and/or triglycerides). The issue of the perceived household financial situation was also addressed. Respondents were any members of the household aged ≥ 18 years.

Detailed illustrated instructions were provided to explain how to measure height (the subject should stand against a wall and be helped by another member of the household wherever possible). Respondents were asked to weigh themselves on bathroom scales immediately prior to answering the questionnaires.

Weight and height were used to calculate body mass index ($\text{BMI} = \text{weight, kg/height, m}^2$). Overweight and obesity were defined as $\text{BMI} \geq 25 \text{ kg/m}^2$ but $< 30 \text{ kg/m}^2$ and $\text{BMI} \geq 30 \text{ kg/m}^2$, respectively.

Respondents were asked about ongoing treatments for diabetes; if confirmed, the nature of the treatment [insulin, oral antidiabetic drugs (OADs), diet only] was reported. Information on antidiabetic treatments was patient-reported on the basis of an exhaustive list of all available treatments at the time of the study. Brand names and internationally recognized active ingredients of the treatments were also included. Respondents were asked to identify those being used. They were also asked to specify the duration of the illness and, if relevant, the duration of insulin treatment. From these answers, the type of diabetes (1 or 2) was determined according to the following algorithm: respondents with type 1 diabetes (T1DM) were those declaring treatment by insulin alone, age < 45 years when diagnosed, and a maximum of 2 years between diagnosis and beginning their insulin treatment. All other cases were considered as T2DM: age ≥ 45 at diagnosis, treatment with OADs with or without insulin, or controlled by diet.

The completed questionnaires underwent systematic proof-reading to reject those that were not suitable for analysis. Double data entry was performed to minimize the risk of errors.

2.3. Response rate

Of the 20,000 questionnaires sent, 14,705 households responded, giving a response rate of 73.5%. From these households, questionnaires from 25,714 individuals aged ≥ 18 years (in mainland France) had complete data for weight and height (65.0% of submitted questionnaires).

2.4. Statistical analysis

Statistical analysis of the ObEpi data has been described in detail elsewhere [16]. For purposes of comparison, data from the non-diabetic population were adjusted for age and gender (or age only) to match levels in the T2DM population. The greater proportion of the T2DM population was, in fact, male and elderly patients. Percentages were compared using the chi-square test, or *t* tests for independent samples. All tests were two-sided and a probability level of $P < 0.05$ was considered statistically

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