Journal of Scientific Research & Reports
3(19): 2477-2485, 2014; Article no. JSRR.2014.19.001

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Diabetes Mellitus in Morocco: Situation and Challenges of Diabetes Care

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Authors' contributions

This work was carried out in collaboration between all authors. Author YD collected the litterature data and wrote the first draft of the manuscript. Author RB managed the literature searches and revised the manuscript. All authors read and approved the final manuscript.

Review Article

Received 22nd March 2014
Accepted 21st May 2014
Published 7th August 2014

ABSTRACT

Diabetes is a pandemic that continues to worry about Governments and health policy makers. It is ranked at the top of chronic diseases that threaten global health with 371 million cases reported by the International Federation of diabetes in 2012. A big percentage of diabetics (80%) exist in developing countries and Morocco is one among them. Diabetes care and medical treatment arrangement are among the several constraints to fight this pandemic in the world in general and the Morocco specifically. This paper is a review on the situation of diabetes in Morocco, its extent, evolution and its complications as well as the disease care and management.

Keywords: Diabetes; care; review; Morocco.

1. INTRODUCTION

Diabetes is a pandemic which continues to worry about Governments and health policy makers. It is among the ten top chronic diseases that threaten global health. According to the International Federation of diabetes (FID), 371 million people are affected by this global scourge in 2012. This number is expected to reach 592 million by 2030. The disease

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continues to hit more disadvantaged social groups. Indeed, while it is growing in developed countries, Diabetes increases more markedly in low- and middle-income countries, where are located 80% of the world diabetic population; Morocco is part of these countries.

It is a silent disease at the beginning of his attack and is translated by chronic increase glycemia which in term is accompanied by severe and disabling micro and macro vascular complications. In addition to its effects on health, diabetes also imposes costs for patients and for society. Type II diabetes represents, alone among all other types of diabetes, 90% of cases and is in evident and dramatic progress in all countries and all regions including the poorest [1,2].

In Africa, for example, type II diabetes is among the major chronic diseases that represent an increased health burden; reaching approximately 14 million diabetics in 2011. This number is predicted to rise to 28 million by 2030 [3]. The actual situation of diabetes everywhere suggests that fighting against this pandemic is far from being won as judged by current data. These show that diabetes is out of control and that no country is fully equipped to repel this burden and that 183 million people with diabetes in the world are not being diagnosed.

Indeed, an effective diabetes care is based first on an equitable distribution of spending on health between developed countries and in developing countries. It must also adopt an interdisciplinary approach including general practitioners, endocrinologists, nurses; educators specialized in diabetes and pharmacists. Furthermore other capacities specialized in the changes of diabetic subjects behavior and self-management other disciplines there are also needed. [4]. This paper is a review on the situation of diabetes, its extent and its evolution as well as its complications in Morocco.

2. ETIOLOGICAL CLASSIFICATION AND NEW RECOMMENDATIONS FOR THE DIAGNOSIS OF DIABETES MELLITUS

Diabetes is a metabolic, pathology due to insufficient insulin production or insufficient responsiveness of tissues to insulin. In the absence of insulin, the body becomes unable to use blood glucose as energy source. Generally there are 3 main types of diabetes namely, diabetes type I, type II diabetes and gestational diabetes.

The diagnosis of diabetes was previously based on the measurement of the levels of plasma glucose and an individual is considered diabetic if glycemia rate is ≥1,26 g/l checked twice in fasting or ≥2, 0 g/l in a glucose tolerance test associated to clinical symptoms.

In 2009 experts groups listed many interests of the HbA1c assay for the diagnosis of diabetes mellitus such as a lower biological variability than the fasting plasma glucose (2% vs. 12 to 15%), a better reflecting of Chronic glycemia and a better correlation and prediction of associated complications [5]. The following groups, the American Diabetes Association (ADA), the European Association for the Study of Diabetes (EASD) and the International Diabetes Federation (IDF) in 2010 and the Swiss society of Endocrinology and diabetology (SSED) and the World Health (who) Organization in 2011 have recommended the determination of HbA1c as the main criterion for diagnosis of diabetes mellitus provided that rigorous quality assurance testing are established [5].

Diabetes mellitus is therefore diagnosed when HbA1c is ≥6.5% measured by a standardized method, a fasting blood glucose is≥1.26 g/L (7.0mmol./L) checked twice or in the presence of classic signs of diabetes with random plasma glucose greater than 2 g/L (11.1mmol./L).

Type I diabetes, occurs due to autoimmune destruction of pancreatic beta islet cells which leading to insulin deficiency requiring daily administration of this later. It develops in people less than 40 years old, most often children and young people. Its symptoms are: polyuria, polydipsia, constant hunger, weight loss, blurred vision and fatigue. The type II Diabetes, occurs when the pancreas secret not enough insulin and the body does not properly use the insulin it produces what is called insulin-resistance. This type of diabetes can appear earlier and is observed even among children and youth due to physical inactivity and obesity [6]. Its symptoms can be the same as those of the type I diabetes but are often less marked.

Gestational diabetes was met for the first time during the third trimester of pregnancy. It is often diagnosed during prenatal screening and not following appearance of symptoms. Women who developed gestational diabetes are at increased risk of developing type 2 diabetes in the next five to ten years.

There are other rare types of diabetes, including those associated with genetic defects, endocrine pancreas disease, infections and some medications that alter the ability of the body to secrete insulin or respond to it [7].

3. DIABETES AND ITS COMPLICATIONS

All parts of the body can suffer from the repercussions of poorly controlled diabetes because hyperglycemia weakens the walls of small blood vessels that supply all tissues with oxygen and nutrients and can lead to serious complications either in the short term as infections, slow healing of wounds, Ketoacidosis or in long-term such as neuropathy retinopathy, nephropathy and cardiovascular diseases. Other complications associated with diabetes include problems related to pregnancy, such as preterm birth and macrosomia, or related to depression [8].

All of these complications are an economic burden for the global health systems where the need to intervene in time to prevent this chronic disease and set up an effective strategy for diabetes care in diabetic people and their complications [9,10].

4. EPIDEMIOLOGICAL SITUATION OF DIABETES IN THE WORLD

The World Health Organization (who) alert globally for years on this epidemic disease. It became one of the most common diseases and one of the main causes of premature death in most countries. The International Diabetes Federation estimated that worldwide, the prevalence of diabetes among adults aged 20 to 79 years was 8.3% in 2012 after adjusting for age, which represents 371 million people with diabetes, this number is expected to reach 592 million by 2030 [3].

In Africa the disease is prevalent, and although the exact figures are rare and controversial, the WHO reported frequencies that vary widely depending on the country. These frequencies are higher in the countries of North Africa [11]. In Mauritania, for example, the prevalence of diabetes is between 7.2 and 10.5% [12]; it is 8.7% in Algeria [13], 9.9% in Tunisia [14], 14% in Libya [15] and 9.3% in Egypt [16].

In sub-Saharan Africa, the current prevalence of diabetes is only 4.3%. However, the rate of undiagnosed diabetics achieved 81.2% and the predictions are on the rise in the next 20 years where the number of people with diabetes will nearly double. On the other hand, this region is experiencing the highest mortality rate associated with diabetes worldwide [3].

The situation is also alarming in the Arab region where among the first 10 countries with the highest prevalence of diabetes, 6 countries are located in this region [17]. Indeed, the highest prevalence in the world is found in the Middle East and Golf countries [11]. As examples, the prevalence of diabetes is about 24% in Saudi Arabia [18], 17% in Qatar [19], 14.1-16.1% [20-21] in Oman and 13.4% in Jordan [22].

5. CAUSES OF DIABETES

If the type I diabetes risk factors are not well known, although the involvement of the interactions between genetic and environmental factors has been reported [23] However, Type II diabetes is fortunately in great part, avoidable by acting on the main modifiable factors of outbreak i.e. obesity or overweight, physical inactivity, unhealthy diet and tobacco [24].

Several causes were involved including urbanization, lifestyle changes and the lengthening of the life expectancy with ageing population are the main drivers of the epidemic [25]. Diabetes care is also a factor of this epidemic.

6. DIABETES CARE

The health systems in most countries are unable to properly manage diabetes. Another constraint on diabetes care is the rate of undiagnosed diabetes that is 50% worldwide. In Africa, this rate reaches 80%.

7. DIABETES IN THE MOROCCO SITUATION

Morocco, as everywhere in the world, is not escaping the trend of diabetes and the disease is one of the major public health problems. It is also noted that recent and current data on the state of diabetes through epidemiological surveys are lacking in Morocco and the most recent are those obtained from the latest national survey conducted by the Ministry of health in 2000, on the risk factors for cardiovascular disease. This epidemiological national study concerned the population aged 20 years and older and reported 6.6% as the prevalence of diabetes corresponding to 1 235 000 diabetics. [26]. This prevalence is higher than that registered in the year 1980 that was 2.26%; with an annual average increase rate of 8% [27]. The IDF estimated, on the other hand, the prevalence of diabetes in Morocco to 7.35% in 2012 corresponding to 1 403 600 diabetics. This rate is similar to that reported in other countries in the region such as Algeria where the prevalence registered by the IDF is 7.54%. It is however; lower than that of other MENA countries like Saudi Arabia that has the most alarming prevalence in the region where the rate has reached 23.38% [3].

On the other hand, the series of the Ministry of health of Morocco, 'Santé en chiffres (2001-2010)' reporting the figure of health data, shows that 5.6% of deaths were diabetic people (Fig. 1) [28]. This rate is only the Iceberg that hides behind an alarming prevalence of deaths due to cardiovascular diseases, which are, in the majority of the cases, complications of poorly controlled diabetes.

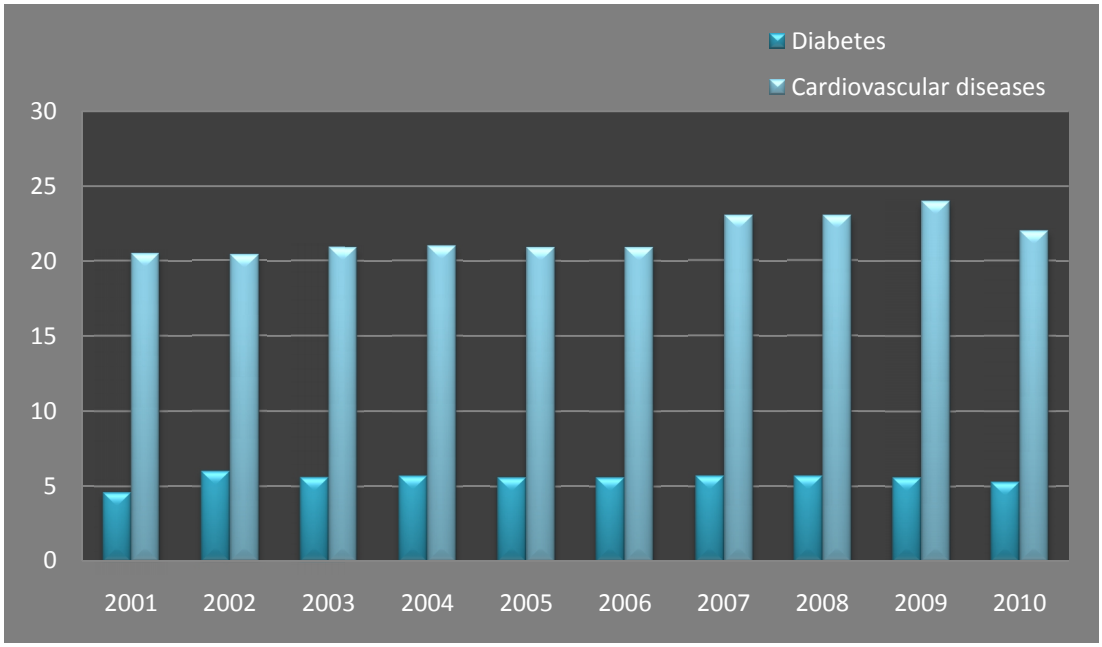

Fig. 1. Evolution of the prevalence of deaths by causes in Morocco in 2001-2010

In addition high rates were reported by other research and regional studies carried out in different regions of the country. This is the case in the middle region of Morocco, where the reported prevalence of diabetes is 10.9% [29], in the South where a rate of 10.3% was found among women [30]. It is also the case in the eastern region of Morocco where a prevalence of 10.2% was reported in the population globally, more marked in urban area and among women compared to rural area and men respectively. In the latter region, the study showed that diabetes care is still limited and requires a global, effective and urgent strategy [31]. The national survey data [26] have also showed that the number of diabetic patients supported by the Ministry of health is 460,000 representing 37% of the diabetics. Among these diabetics, 220,000 required insulin that is given free of charge to the patients at the Ministry of health facilities; that corresponds to 48% of diabetics that benefit of support.

8. CAUSES OF DIABETES IN THE MOROCCO

The causes of the increase of diabetes rate in Morocco include the epidemiological, demographic and nutritional transition. In fact the shift from a rural and traditional way of life to a modern and urban lifestyle associated with the increase of stress, a change of lifestyle characterized by a practice of sedentary activities and a change in eating habits are accompanied by the onset of chronic diseases that are cardiovascular risk factors including diabetes. These changes lead to the increase of obesity and associated diseases [32] leading to epidemiological transition characterized by a substitution of infectious diseases by chronic non-communicable diseases including hypertension, cancer, and diabetes [33]. In addition the increased diabetes prevalence is also related on one hand to the unfortunately late screening by health professionals, when 30% of the patients have already developed diabetes-related complications and, on the other hand to the fact that 50% of the patients in the Morocco are unaware of their diabetes.

Several studies data have shown that undiagnosed diabetes is prevalent in Moroccan population [34]. Research in the Eastern Morocco, [31] has also shown that more than 80% of diabetic patients discover their disease for the first time in public health centers and private medical cabinets. The research showed also that only 24% of people with diabetes are well-controlled.

To stem the tide of this condition and avoid or minimize its burden on health care system and on the national economy, the Ministry of health of Morocco has included the prevention and control of diabetes as a priority program in its health action plan 2012-2016.

In Morocco, at the national level, diabetes care is limited. Indeed, according to the Direction of Epidemiology' report in 2011 [35], the number of diabetics supported by the Ministry of health is only 460,000 representing 33% of diabetics; among them 220,000 patients require insulin (Fig. 2).

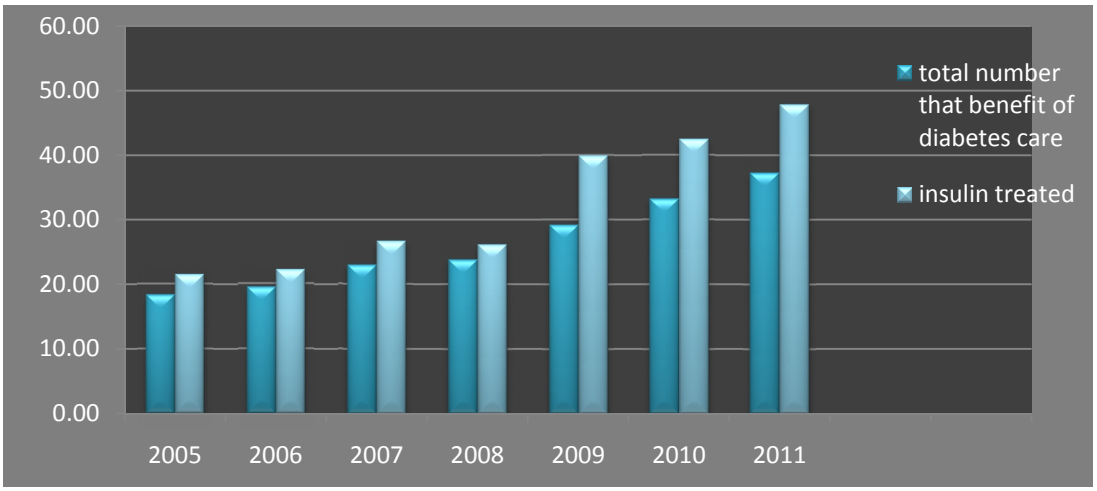

Fig. 2. Evolution of diabetes care in public health facilities during 2005 – 2011 period

Like countries around the world, diabetes in Morocco, is a real public health problem; hence urgent need to establish a national strategy, focused on prevention, raising awareness and facilitating the access to care.

Nationally, 46 monitoring and diabetes care units have been implemented in 2005. These units have been provided with medical-technical equipment and fungible reagents ensuring biological examinations related to the assessment of blood glucose, glycated hemoglobin and urinary parameters; however, they remain insufficient to ensure the proper monitoring and control of diabetics in the country.

Another limiting factor concerns specialized human resources. The available number of about 199 endocrinologists is insufficient with more than half of them (n = 105) in public sector and 60% distributed in major cities specifically in the axis Casablanca-Rabat (the administration and economy capitals), which negatively affects the quality of the disease care at the peripheral level [36].

A survey conducted by High planning Commissariat (HCP), from January 30th to February 20th, 2012, on a sample of 3200 persons aged 15 and more, including 2080 in urban areas, showed that despite the efforts provided by the Ministry of health in this area, the degree of dissatisfaction about the health services and facilities was nearly 72 percent for the whole population against just 8% who are satisfied or very satisfied. The study also showed that almost half of Moroccans put forward the free services, the proximity of health facilities and the quality of health services as the important determinants of well-being [37].

To our knowledge there is no evaluation of the national program on the prevention and fight against diabetes, established in the 2008-2012 strategic plans. This evaluation would be an important tool for the revision and the strengthening of diabetes surveillance and the reduction of differences between the various regions of the Kingdom. The Prevention of diabetes involves also the improvement of the population nutritional status and in this context there is also a need enroll implementing and monitoring of the nutritional strategy [38].

9. CONCLUSION

Diabetes is a complex non-communicable disease recognized by the United Nations as a threat to health in the world and also in Morocco. The measures taken to prevent diabetes or delaying the onset of its complications have a positive impact on health, including a reduction in cardiovascular disease and kidney failure [39].

Policy makers must commit to settle an effective and efficient strategy to combat diabetes and control properly its complications. They should facilitate access to care especially for vulnerable population as in rural area. They also need to train specialized human resources and acquire fungible means to ensure the follow-up and good control of diabetes.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
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