Prevalence, consequences and treatment of diabetes in the urban health center Moulay El Hassan in the province of Kenitra, Morocco

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ABSTRACT

Introduction: The prevalence of diabetes is growing progressively worldwide, despite the efforts of various national and international health organizations.

Aim: The aim of this study was to determine the prevalence, the consequences and the treatment of diabetes in the provincial reference center for diabetes (CRD) in Kenitra, Morocco, in 2014 and 2015.

Material and methods: During 2014-2015, the total of 31563 patients (2227 diabetic and 29336 non-diabetics) who consult the urban health center Moulay El Hassan Kenitra were considered as a target population of this study. The data has been collected by nurses under the direction of doctors of the health center, using a data sheet containing information on: socio-demographic (age, gender); types of complications related to the disease.

All the collected data were analyzed using SPSS software version 16. Thus the categorical variables as means and standard deviations (δ) for quantitative variables were used to determine the frequencies and percentages of each studied group.

Results: The age of patients is between 8 months and 80 years with a predominance of women (64.4% and 35.5% of women and men, respectively). Besides, the diabetes is higher among people having 40 years of age and older with a prevalence of 90.99% than other ages, which prevalence is only 9.01%. It is also higher among women with 61.47% than men aged 40 years and older (29.53%). Accordingly, the global prevalence of diabetes for 2014 and 2015 are 6.6% and 7.05%, respectively, with a non-significant increase (p> 0.05). Nevertheless, the prevalence of diabetes-related complications decreased insignificantly (p>0.05) from 9.75% in 2014 to 8.24% in 2015.

Conclusion: The results of this work demonstrate that even if the increased prevalence of diabetes is low, his pattern still increasing. Factors such as lifestyle and socioeconomic status population are required to better understand the factors promoting the increase of diabetes occurrence.

Key words: Prevalence, Diabetes, Diabetes-related complications.

INTRODUCTION

Diabetes is one of the most common chronic diseases in the world, developed by a growing number of people, thus increasing its prevalence.1,2 It is estimated that it will increase from 6.4% in 2010 to reach 7.7% of the world population by 2030.3 This is not due to a single cause, but rather of a combination of factors such as demographic, clinical and lifestyle.4 The lack of physical activity and a high-calorie intake greatly encourage the gain of weight, possibly leading to obesity, which is a key risk factor for diabetes.5,6 Diabetes belongs to the non-communicable diseases, where its prevalence is high especially among urban populations who tend to gain weight either due to a poorly balanced diet or because of sedentary lifestyles.5,6

The severity of diabetes elucidates its health impacts in the long term, namely retinopathy; kidney disease, heart disease, high blood pressure and diabetic foot,7,8,9,10 and also by its difficult and costly management for the health sector especially...
in developing countries such as Morocco. The spending in Morocco exceeds 206 million USD and 367 billion USD in the world in 2010, which represent 12% of the global health spending.11

Diabetes is incurable, hence the need for lifelong treatment, and glycemic control that could keep blood sugar within the normal limits in order to prevent the development of acute complications.12,13,14 Despite the efforts of the health sectors and global organizations, many aspects related to the health of patients with diabetes remain unclear, due to an insufficient number of studies which were interested in the patient himself.15

In Morocco, there are several studies concerning various aspects of diabetes such as complications associated with the disease,16 its management17 and traditional medication.18 However, the number of work aimed to study the prevalence, the complications and the treatment of diabetes remain modest.

The objective of this study was to determine the prevalence, the consequences and the treatment of diabetes in the provincial referral center for diabetes (CRD) located in Kenitra, Morocco between 2014 and 2015.

**MATERIALS AND METHODS**

**Population and Study Environment:**

The target population is formed by 31563 patients: 2227 diabetics (7.06%) and 29336 nondiabetics (92.94%); who consult the only provincial reference center of diabetes (CRD) located in the Urban Health Center -Moulay El Hassan in the city of Kenitra Morocco. This study was performed during a period of two years (from January 2014 to December 2015). The age range of patients was from 8 months to 80 years (64.4% women; 35.5% men).

**Study Method:**

The data has been collected by nurses under the direction of doctors of the health center, using a data sheet containing information on: socio-demographic (age, gender); types of complications related to the disease (Hypoglycaemic-coma or ketoacidosis; retinopathy, diabetic foot, nephropathy, coronaropathy, cerebrovascular accident, Hypertension), and the types of medical treatment of diabetes used (only dietary rules, insulin; oral anti-diabetics, insulin + oral anti-diabetics).

The authorization of the data collection was acquired from the Regional Directorate and the Provincial Delegation of Health. Anonymity and confidentiality of patient’s data have been met. Data were entered and analyzed using SPSS software Version 16.

**RESULTS**

Longitudinal study of diabetes prevalence by sex:

According to figure1, the prevalence of diabetes is higher among women (66% in 2014, 66.5% in 2015) than men (33.5% in 2014, 34% in 2015). The difference of the global prevalence of diabetes between 2014 (6.6%) and 2015 (7.06%) was not significant (P> 0.05).

![Figure 1: Prevalence of diabetes by sex between 2014 and 2015](image)

Identification of the age groups at risk of diabetes by sex:

Table 1 shows the size of new cases detected with diabetes and old cases by age and sex. It shows that the prevalence of diabetes is higher among people ages 40 and older (90.99%) than persons under 40 years (9.01%), also the prevalence of diabetes is higher among women ages 40 and older (61.47%) than men (29.53%).
Table 1: The size of diabetic patients by sex and age (2014 situation)

<table>
<thead>
<tr>
<th>Age</th>
<th>0 – 19 y o</th>
<th>20 – 39 y o</th>
<th>40 – 59 y o</th>
<th>60 y o and +</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
</tr>
<tr>
<td>new cases</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>old cases</td>
<td>17</td>
<td>20</td>
<td>59</td>
<td>73</td>
<td>303</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>23</td>
<td>60</td>
<td>87</td>
<td>319</td>
</tr>
</tbody>
</table>

Table 2 shows the size of new cases detected with diabetes and old cases by age and sex, (2015 situation). It shows that the prevalence of diabetes is higher among people ages 40 and older (86.21%) than persons under 40 years (13.79%), also the prevalence of diabetes is higher among women ages 40 and older (65.41%) than men (34.59%).

Table 2: The size of diabetics by sex and age (2015 situation)

<table>
<thead>
<tr>
<th>Age</th>
<th>0 – 19 y o</th>
<th>20 – 39 y o</th>
<th>40 – 59 y o</th>
<th>60 y o and +</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
</tr>
<tr>
<td>new cases</td>
<td>0</td>
<td>1</td>
<td>6</td>
<td>10</td>
<td>16</td>
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<tr>
<td>old cases</td>
<td>20</td>
<td>24</td>
<td>65</td>
<td>97</td>
<td>334</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>25</td>
<td>71</td>
<td>107</td>
<td>350</td>
</tr>
</tbody>
</table>

Consequences of diabetes:

Figure 2 shows that high blood pressure and nephropathy, are the two most common complications respectively with a rate of (46.3% in 2014 and 42.2% in 2015) and (30.41% in 2014 and 25.35% in 2015) then the diabetic foot with a percentage of 12.37% in 2014 and 11.34% in 2015 and retinopathy with a prevalence of 9.2% in 2014 and 7.21% in 2015. According to student test, the difference between the size of each complication was not significant (p＞0.005) between 2014 and 2015.
Treatment of Diabetes:

Figure 3 shows the distribution of diabetics by type of treatment. The high frequency in this sample belongs to the patients who take the oral anti-diabetics (OAD) in both years, (67.3%) for 2014 and (64.3%) for 2015.

![Diagram showing the distribution of diabetics by type of treatment.

Fig. 3: Distribution of the population by type of diabetes treatment.

The average age of this population is between 8 months and 80 years with a dominance of women in both years (66.5% for 2014 and 62.32% for 2015). This distribution is larger and comparable with the results reported by several authors in France, where they found that the distribution of diabetes is more common in men than in women (55% and 45%). These obtained results were in accordance with those reported for most other studies in different countries.

The prevalence of diabetes is higher among women (61.47%) than men (29.53%) with the age of 40 and older, this difference could be explained by the fact that the number of women in our sample is higher than that of men, which influences the prevalence. A possible reason for this is that the majority of women in this study are housewives, allowing them time to consult the health center, unlike men who might find difficulty in visiting the center for consultation due to work.

The prevalence of diabetes is higher among people aged 40 and older (90.99%) than the other ages (9.01%) over the two years, this result is similar to that approved by the IDF in 2013, which is explained by the fact that the age is one of the risk factors for diabetes.

High blood pressure (hypertension) is the most common complication, it is present with a percentage of (46.3%) and (42.2%) respectively in the two years of 2014 and 2015. Several studies have shown that this is the most common complication among diabetics. In the study reported by Monabecaandal, the prevalence of hypertension was 11.53%. For Billault and Coll., The prevalence was 29.7% and according to the WHO, the prevalence was 33.9%.

After hypertension comes diabetic nephropathy (DN) with a percentage of 30.41% in 2014 and 25.35% in 2015. Several studies have concluded that diabetic nephropathy (DN) is the leading cause of a terminal chronic kidney failure in the world. Nationally, The (DN) was the leading cause of chronic kidney failure (30%) according to a 2006 survey in the emergency department of the Ibn Sina Hospital in of Rabat. The physiological relationship between diabetes and kidney disease is elucidated by the development of small vessels due to excess sugar in the blood.

Unlike the prevalence of diabetes that has increased, the prevalence of complications has reduced. This coincides with the recruitment of a dietician responsible for nutrition education for patients in the CRD in January 2015, this action was described by the Ministry of health in 2013, which aimed to promote weight loss through nutrition education that represents an important therapeutic target for overweight people with diabetes.
Diabetics of this population are mainly treated pharmacologically in the two years; only 0.76% in 2014 and 0.62% in 2015 are under diet as a treatment. Concerning the pharmacological treatment, 67.3% in 2014 and 64.3% in 2015 of diabetics are treated by OAD, 29.9% in 2014 and 29.3% in 2015 by insulin, and 1.91% in 2014 and 4.4% in 2015 by OAD+insulin. These same results were reported by Mr. virally and Coll., in 2009. The high percentage of diabetics taking OAD as a treatment returns to the fact that the most common diabetes in our sample is type 2 diabetes whose OAD are the most used treatment for this type of diabetes.

CONCLUSION

This study allowed us to review the severity of diabetes, which is the progressive increase of its prevalence, despite the efforts provided by the various sectors of health, and the huge financial spending dedicated to improving its management. In this case of study, although this increase is low (0.45%) between the two years, it is considerable, so more detailed studies on several aspects such as lifestyle and socioeconomic status of the patients are necessary to better understand the factors that promote this increase.

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REFERENCES