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Epidemiological Profile of type 1 diabetes in Children: about 971 Patients

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Summary

Diabetes is a chronic disease that is a public health problem. Its gravity is related to its acute and chronic complications. In children, this disease is becoming more and more common, with serious repercussions on the quality of life of the child, his family and his current and future health.

The purpose of our work is to describe the epidemiological profile of 971 patients admitted to our training between 2015 - 2018.

Keywords: Type 1 diabetes; Child; Age; Ketoacidosis

Introduction

Diabetes is one of four priority noncommunicable diseases (NCDs) identified by WHO and could become the 7th leading cause of death worldwide by 2030 [1].

In Africa, 80% of people with diabetes are not diagnosed in time [2]. Type 1 diabetes (T1D) remains by far the most common form of diabetes in children. The incidence of type I diabetes has steadily increased over the past two decades. This progression is particularly strong in younger children, leading to a rejuvenation of the age of discovery of diabetes and about 25% of diagnoses of type 1 diabetes are thus made in children under 5 years [3].

According to the Moroccan Minister of Health "About 2 million Moroccans over the age of 20 are diabetic, 50% of whom are unaware of this disease [4]. The number of diabetics has increased by 25% in 5 years from 2011 to 2015. Thus, 625,000 people receive treatment for diabetes in health centers, including 15,000 children with insulin-dependent type diabetes (T1D). Indeed, the main finding is that children under 15 years are increasingly affected by this disease [4].

Materials and Methods

We conducted a retrospective cross-sectional study of diabetes mellitus in children under the age of 16 over a 4-year period from January 2015 to December 2018.

The objective of this study is to define the epidemiological profile of the population of diabetic children identified in the endocrino-diabetology service at the Children's Hospital - Ibn Sina University Hospital Center - Rabat.

Results

From January 2015 to December 2018, 971 patients with type 1 diabetes were admitted to our service.

A comparative breakdown of the number of hospitalizations between the years 2015 and 2018 is carried out in favor of an increase in the hospitalization rate of 8% over the years. (Chart 1)

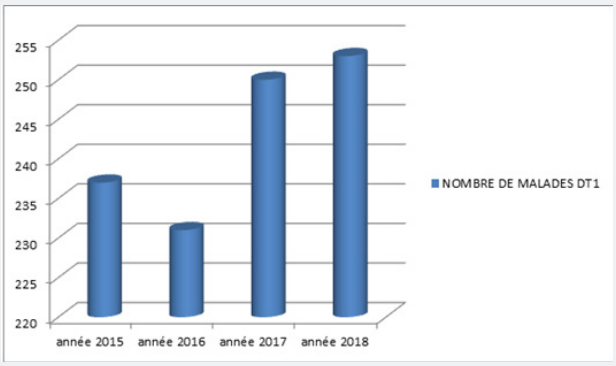

Chart 1: Number of cases by year of hospitalization.

Diabetes is revealed mainly in the stage of complications (diabetic ketosis or ketoacidosis).

The average age of our patients is 7.25 years, with an increased frequency in patients> 5 years old; as shown in the following graph: (Chart 2)

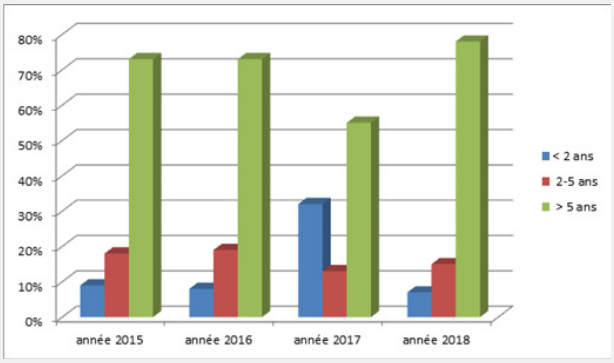

Chart 2: The distribution of our patients according to age groups.

There were 483 girls (49.8%) and 488 boys (50.2%); without significant difference between girls and boys with a sex ratio boy / girl of 1.01. (Chart 3)

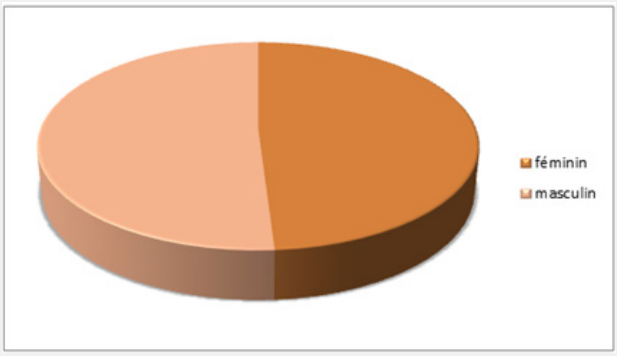

Chart 3: Distribution of our patients by gender.

In our series, the discovery of diabetes in our patients was in autumn with a percentage of 30%.

Discussion

Type 1 diabetes is a chronic disease diagnosed most often at a young age (2/3 of cases before the age of 20) with an increase in its worldwide incidence over the last twenty years, especially in the youngest age groups [5].

According to the international project DIAMOND (World Health Organization Project Childhood Diabetes) launched by WHO in 1990, which aimed to monitor the incidence of T1D1 of children under 15 between 1990 and 1999 in 112 centers out of 57 countries; A total of 43,013 cases were diagnosed in the study population of 84 million children (4.5% of the world population), an overall incidence of diabetes to 5/100,000 children per year. It varies enormously between different countries, being higher in Finland and Sardinia (Italy) (57.6/100000/year) and lower in Venezuela and China (0.1/100000/year) [6].

An important epidemiological characteristic of the child's T1D is its mode of revelation, which is 40% that of ketoacidosis according to the latest studies [7-8]. This situation due to a delay in diagnosis may be life-threatening.

According to European data from the EURODIAB collaborative group [9], the mode of developing ketoacidosis of diabetes in children can reach 50% of the total revelation patterns in some countries. The part of this mode of revelation must be reduced, because at this stage it places the child in a situation of vital risk in the short term, but also of deterioration of cognitive functions in the longer term [10].

According to a nationwide study of T1D children from 2002 to 2016 [11].

Ketoacidosis revealed type 1 diabetes in 107 children, a prevalence of 53%. This rate tends to decrease in other countries and seems to reach 40% in France for example in 2014 [12].

this downward trend has also been observed in our Moroccan population. From 68% in 2005, the proportion of diabetic ketoacidosis recorded was less than 50% in 2016. This downward trend is due to the many diabetes campaigns conducted in Morocco [11].

T1D is most often found in the older child as evidenced by the average age (7.25 +/- 1.5 years) in our series; with a frequency peak observed around puberty (similar to the age group 9 to 15 years); indeed, many French and European studies have found it since 1990 until 2015 [13].

In the worldwide DIAMOND study [6], under the auspices of WHO, the sex ratio is 1.06. in the EURODIAB Study it is of the order of 1.11 [9]; and in the Languedoc-Roussillon study conducted in 2015, the sex ratio is 1.09 [13].

The European study points out that there is a male predominance in countries with a high incidence of diabetes (more than 23/100,000 children per year) and a female predominance in lower incidence countries (less than 4.5/100,000). children per year), ie more girls in populations of African and Asian origin and more boys in populations of European origin [13].

Our data match those described in the literature a sex ratio (boy/girl) of 1.01 with a male predominance.

Regarding seasonal variations of T1D; the EURODIAB GROUP has shown that the discovery rate of T1D is increased in autumn and winter regardless of sex. This variation is much greater in the 10-14 age group (+/- 24.9%) than in the 5-9 age group (+/- 19.8%) and in the 0-4 age group (+/- 8, 7%) [9], Another study carried out on a Maghrebian scale objectified a fall detection rate of T1D in the order of 40% of cases [14].

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In our study, cases of T1D were more often diagnosed in the fall, which is consistent with data found in the literature. (Chart 4)

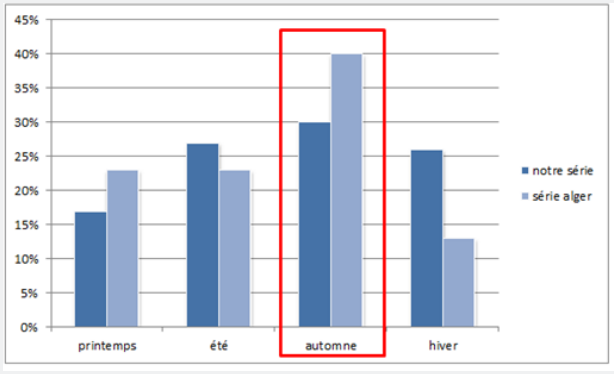

Chart 4: Distribution of T1D patients by season of hospitalization.

This seasonal variation reinforces the hypothesis of a viral origin of type 1 diabetes, with immediate effect (especially in schools). However, the infection itself results in insulin resistance and may accelerate metabolic decompensation in a child whose beta cell function is impaired. The Finnish Diabetes Prediction and Prevention study shows seasonal variations in the appearance of diabetes-specific autoantibodies with a higher frequency in autumn [15].

Conclusion

Type I diabetes mellitus is a public health problem because of its high frequency, particularly in recent years, where environmental factors are mainly implicated in the onset of the disease; It can occur at any age, but much more frequently in young children or young adults who have just started their working life. It is a condition occurring on a genetically predisposed field whose prevention at the pre-diabetes stage must involve new technologies of molecular biology.

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