A descriptive Study of Diabetes Mellitus among School Children Attending Health Insurance Clinic

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Abstract

Background: Diabetes mellitus in children is a major health problem changing the lifestyle of affected children and their families.

Objective: to describe the pattern of diabetes mellitus in the affected children including age, sex distribution, associated risk factors, presenting symptoms, presence or absence of complication, associated medical problems, management plan and therapy.

Methodology: This study is a descriptive study, conducted on 83 children seeking for health insurance services for follow up and treatment of diabetes mellitus, their ages ranged from 5 to 17 years old attending Sherbein Health Insurance clinic from January, 2015 to April, 2015. Full history and clinical examination were taken. Laboratory investigation of routine urine, stool analysis, blood sugar, CBC and glycated hemoglobin were performed.

Results: Results show that girls were more affected than boys. Increased incidence of onset of diabetes mellitus at age group (11-14) years. The associated risk factors were positive family history 39.8%, positive consanguinity 24.1% and early introduction of cow milk 27.7% of cases. Polyuria occurred in 90.3% of cases. Coma is the most common recurrent complication. School absence found in 21.7% of cases. Only 38.6% of cases have a dietary regimen. Regular activity found in 41% of cases. Results show that 90.4% of cases follow their insulin regimen and 38.6% of cases has a bad glycemic control.

Conclusion: Positive family history of diabetes mellitus, positive consanguinity and early introduction of cow milk are considered risk factors for the incidence of diabetes mellitus in children. Lack of healthy diet and healthy life style increase the occurrence of complication.

Key words: Children, D.M., Pattern, Risk Factor.

دراسة وصفية لداء السكرى فى أطفال المدارس المترددين على عيادات التأمين الصحي

المقدمة: يعتبر داء السكرى من أكثر الأمراض المزمنة شيوعا والتى تشخص بارتفاع نسبة السكرى فى الدم كسمة بيوكيميائية أساسية ويتم تصنيف داء السكرى إلى نوعين، النوع الأول والذى ينجم عن نقص افراز الأنسولين فى البنكرياس نتيجة تلف خلايا بيتا، والنوع الثانى والذى ينجم عن مقاومة الأنسولين التى تحدث على مستوى الخلية بدرجات مختلفة.

الهدف من الدراسة: وصف نمطية حدوث المرض فى الأطفال المصابة (بداية حدوث المرض، المضاعفات المصاحبة وخطة العلاج).

المنهجية: تم اجراء هذه الدراسة على كل الأطفال الذين تتراوح أعمارهم (٥– ١٧) عاما ممن يحصلون على الخدمات العلاجية والمتابعة الشهرية لداء السكرى بعيادة شربين الشاملة للتأمين الصحي، وذلك لمدة أربعة شهور، وتم التقييم السريرى الكامل لكل الأطفال المرضى بما فى ذلك التاريخ المرضى الكامل، التاريخ المرضى الأسرى، الفحوصات المخبرية الروتينية. وقد خضع جميع الأطفال المرضى الى تسجيل التاريخ المرضى الكامل، متضمنا بداية اكتشاف المرض، نوع العلاج المتبع، حدوث مضاعفات، تحديد عوامل الخطوره، اجراء الفحوصات المعملية الالية مثل صورة الدم الكاملة، فحص البول والبراز واختبارالهيموجلوبين السكرى.

النتائج: وقد أوضحت الدراسة ارتباط حدوث المرض بوجود عوامل الخوره المتمثلة فى وجود تاريخ مرضى للاسره، زواج الأقارب والادخال المبكر للالبان الحيوانية خلال السنة الأولى من العمر. وقد تبين أن المرضى الذين يلتزمون بنظام غذائى صحى يمثلون فقط ٣٨,٦% من اجمالى الحالات، أما المرضى الذين يقومون بعمل نشاط رياضى منتظم فقد مثلوا ٤٩% من اجمالى الحالات معظمهم من الذكور. وقد تبين حدوث واحد أو أكثر من مضاعفات داء السكرى فى ٦٨,٧% من الحالات تنوعت بين الاصابة بغيبوبة سكرية متكرره، داء السلس البولى الليلى، العدوى المتكرره والالتهابات الفطرية المتكرره. تم الحصول على بيانات تفيد أن ٩٢,٨% من الحالات يستخدمون قلم الانسولين بينما يستخدم ٧,٢% السرنجات للحصول على احتياجاتهم اليوميه من عقار الانسولين.

Introduction:

Diabetes mellitus is a complex, chronic illness requiring continuous medical care with multifactorial risk reduction strategies beyond glycemic control. Ongoing patient self-management education and support are critical to preventing acute complications and reducing the risk of long-term complications. Significant evidence exists that supports a range of interventions to improve diabetes outcomes. (TEDDY Study Group, 2007)

Diabetes mellitus (DM) is a metabolic disease characterized by absolute or relative insulin deficiency. Absolute deficiency of insulin most commonly results from an autoimmune destruction of insulin producing cells in the pancreas and in general, the term Type 1 DM (T1DM) is used to denote childhood diabetes associated with autoimmunity and absolute insulin deficiency, the term Type 2 DM (T2DM) is used to denote diabetes resulting from a relative deficiency of insulin when insulin secretion is inadequate to overcome co-existent resistance to insulin action on carbohydrate, protein or fat metabolism. Epidemiological studies indicate that there is gradual but steady increase in the incidence of both T1DM and T2DM in both developed and developing countries (El-Zanaty and Way, 2009).

Regarding Egyptian society nowadays, Diabetes is widespread in many families, nearly 10.4% of the Egyptian population aged (10- 79) years have Diabetes as it is mainly inherited in Egyptian families, moreover Egyptians unhealthy diet may contribute to Diabetes' spread too (Ismail et.al., 2008, El Ziny et.al., 2014).

Epidemiological studies for childhood T1DM from Egypt are scarce. This has been attributed to many reasons including lack of diabetes registries, scattered medical facilities and suboptimal capturing of new cases. The prevalence of T1DM was estimated at 109/ 105 and 112/ 105 in children of school age in the Heliopolis (Salem et.al., 1990) and El-Manial districts (Ghali and Eldayem, 1990) of Cairo, respectively.

The incidence rates in our pediatric population from the Nile Delta region were lower than those reported from neighboring countries including Sudan (10.1/ 105), Libya (7.8/ 105), Tunisia (6.76/ 105), Saudi Arabia (27.5/ 105), Kuwait (20.1/ 105) and Turkey (7.2/ 105). (Ismail et.al., 2008)& (Soliman, 2013)

Objective:

The aim of the present study is to describe the pattern of diabetes mellitus in the affected children including age, sex distribution, associated risk factors, presenting symptoms, presence or absence of complication, associated medical problems, management plan and therapy.

Patients And Methods:

This study is a descriptive study, conducted on 83 children seeking for health insurance services for follow up and treatment of diabetes mellitus, their ages ranged from (5- 17) years old attending Sherbein Health Insurance clinic from January, 2015 to April, 2015.

Full history and clinical examination were taken. Laboratory investigation of routine urine, stool analysis, blood sugar, CBC and glycated hemoglobin were performed. Full history included sex and age distribution, age of onset of D.M, predisposing and risk factors including positive family history, positive consanguinity and early introduction of cow milk in infancy. Full clinical examination including anthropometric measures of cases permitted detection of complication of diabetes as (recurrent chest infection, urinary tract infection, upper respiratory tract infection, peripheral neuropathy, monlial vaginitis, …).

Laboratory investigation were performed to evaluate the condition which included routine urine and stool analysis, blood sugar, CBC and glycated hemoglobin.

Ethics Committee Approval:

After previous consent of the ethics committee approval (Ain shams University Committee of research ethics.

Statistical Analysis:

Data obtained were assessed with SPSS 15.0 statistics software package. t-test was used to test the significance of the difference between two groups Significance level in these tests was determined to be <0.05. (Mostafa& El-Shourbagy, 2010)

Results:

Table (1) shows that 59% of cases are females and 41% of cases are male.

Table (1) Sex distribution among diabetic cases:

Sex	Frequency	%
Male	34	41.0
Female	49	59.0
Total	83	100.0

Tables (2&3) shows that occurrence of diabetes mellitus has significant increase in age group from 11 to 14 years (40.5%). The present study revealed increased incidence of onset of diabetes mellitus at age group 11-14 years which is peri-pupertal age.

Table (2) Age distribution among diabetic cases

Age/Year	Frequency	Percentage%
5≤	2	2.4
5- 8	6	7.2
8- 11	15	18.0
11- 14	30	36.2
14- 17	30	36.2
Total	83	100

Table (3) Age of onset of Diabetes Mellitus

Age Group	Frequency	Percentage%
≤5	3	3.6
5- 8	6	7.2
8- 11	27	32.5
11- 14	41	49.5
14- 17	6	7.2
Total	83	100

As regard HbA1c, table (4) shows that 25.3% of cases has a good control, 36.1% has a moderate control, while 38.6% has a bad control.

Table (4) Glycated hemoglobin among diabetes children

Hbac%	Frequency	Percentage%
7-8	21	25.3
8-9	30	36.1
9≥	32	38.6
Total	83	100.0

Table (5) shows that 68.7% of cases have a combined therapy of long acting insulin and rapid acting insulin, while 31.3% has monotherapy of one type of insulin. 92.8% of cases get their insulin via penfill while 7.2% of cases use disposable syringe.

Table (5) Cases of diabetes mellitus related to their insulin regimen

Insulin Regimen	Frequency	Percentage%
Actrapid And Mixtard Penfill	57	68.7
Acrapid Penfill	5	6
Mixtard Penfill	15	18.1
Mixtard Vial	6	7.2
Total	83	100

The associated risk factors for developing diabetes mellitus type 1, were: positive family history (39.8%), positive consanguinity (24.1%), and early introduction of cow milk (27.7%) of cases.

Polyuria occurred in 90.3% of cases, then polydepsia represented (77.1%) of cases. As regards diabetic complication, coma represented 28.9% of all cases, hypercholesterolemia 9.6%, nocturnal 16.9% of cases, recurrent urinary tract infection 8.4% of cases and monilial vaginitis 7.2% of girls.

School absence found in 21.7% of cases. The study revealed that 38.6% of cases have a dietary regimen and 41% having regular activity.

Routine stool analysis shows that 31.3% of cases have parasitic infestation.

Discussion:

Diabetes mellitus in children is a major health problem changing the lifestyle of affected children and their families.

The aim of the present study is to describe the pattern of diabetes mellitus in the affected children including age, sex distribution, associated risk factors, presenting symptoms, presence or absence of complication, associated medical problems, management plan and therapy.

This descriptive study conducted on 83 children seeking for health insurance services for follow up and treatment of diabetes mellitus, their ages ranged from 5 to 17 years old attending Sherbein Health Insurance clinic from January, 2015 to April, 2015. Full history and clinical examination were taken. Laboratory investigation of routine urine, stool analysis, blood sugar, CBC and glycated hemoglobin were performed.

The present study revealed increased incidence of onset of diabetes mellitus at age group (11- 14) years which is peri-pupertal age.

The age group (10- 14) years had about twice the risk of developing T1DM compared to children younger than 5 years and this trend did not vary by gender. (Diamond, 2006)

In the total patient population and also in both genders, T1DM occurrence increased significantly with age, reaching a peak in the age group 6-10 years, before falling to a much lower rate in the age group (11- 18) years (El Ziny et.al., 2014).

However, data from Tunisia, Kuwait and Turkey (males only) showed that the incidence of T1DM peaked in the age group 10-14 years and peaked in 5-9 years in Turkish females only (Ismail et.al., 2008).

The present study revealed that girls were more affected than boys.

A significant female predominance among the total patient population in both rural and urban areas, but only in the age group (6- 10) years. Results appear to be in line with literature data where female predominance was significant among Libyan, Saudi and Turkish T1DM patients. (Ismail et.al., 2008, El Ziny et.al., 2014)

As regard HbA1c, 25.3% of cases has a good control, 36.1% has a moderate control, while 38.6% has a bad control.

In the present study, 68.7% of cases have a combined therapy of long acting insulin and rapid acting insulin, while 31.3% has monotherapy of one type of insulin. 92.8% of cases get their insulin via penfill while 7.2% of cases use disposable syringe.

In agreement, a study by Ismail et.al. (2008), showed that 69% of their cases had a combined therapy.

In the present study, the associated risk factors for developing diabetes mellitus type 1 were: positive family history (39.8%), positive consanguinity (29.3%), and early introduction of cow milk (20.7%) of cases.

Ismail and others (2008) reported that positive family history (5.5%), positive consanguinity (24.1%), and early introduction of cow milk (27.7%) of cases.

In the present study, polyuria occurred in 90.3% of cases, then polydepsia represented (77.1%) of cases.

In a study by Ismail et.al. (2008), polyuria occurred in 90.14%, then polydepsia represented (80.04%) of their cases.

In the present study, regarding diabetic complication, coma represented 28.9% of all cases, hypercholesterolemia 9.6%, nocturnal 16.9% of cases, recurrent urinary tract infection 8.4% of cases and monilial vaginitis 7.2% of girls. School absence found in 21.7% of cases. The study revealed that 38.6% of cases have a dietary regimen and 41% having regular activity. Routine stool analysis shows that 31.3% of cases have parasitic infestation.

Conclusion:

Positive family history of diabetes mellitus, positive consanguinity, early introduction of cow milk in infancy are considered risk factors for increasing incidence of diabetes mellitus in children. Lack of healthy diet and healthy life style increase the occurrence of complication of diabetes mellitus in children. Increase occurrence of parasitic infestation in children.

Recommendations:

It's recommended to promote health education of diabetic children and their families about the importance of healthy diet and healthy life style in controlling the blood glucose level and to minimize diabetic complications.

Diabetics in Egypt need advancement in the way of counseling and treatment; the future of diabetic care in Egypt rests on the public education, expertise diagnostic, preventive and treatment strategies, and resources of research funding. With these assets, we can progress strategically towards overcoming this problem.

Observations confirm the need to develop a national registry for T1DM and the need for further multicenter epidemiological research studies covering the whole country to define the nationwide T1DM incidence and the related health data in Egypt.

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