

CHILDHOOD DIABETES MELLITUS IN THI-QAR CITY

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ABSTRACT

This retrospective study was done on 179 of newly diagnosed children with insulin-dependent diabetes mellitus who were admitted over 5 years (Jan. 2003- Dec. 2007) to two main hospitals in Thi-qar city-Iraq . Majority of patients (79,3%) were between 5-12 years of age ,while the minority (20,6%) were less than 5 Years of age. The frequency of cases was correlated with increasing age . Male cases were 100 (55,8%) , females were 79 (44%) , male to female ratio was 1,2:1. Family history was positive in 81(45%) cases . Most of our patients 58% were from urban areas , while those from rural areas constitute 42%. Clinically 114(63,6%) patients presented with the classical symptoms of type 1 diabetes mellitus. At the onset 43 (24%) patients had ketoacidosis, five of whom were comatose. Most cases / 111(62%) presented in Winter and Autumn seasons, showed male predominance, shorter duration of symptoms and commoner presentation of ketoacidosis than in the other seasons. Thirty-two patients were had preceding history of viral illness or emotional stress during 2-4 weeks before presentation.

Key words: Childhood diabetes Mellitus , Thi-Qar.

INTRODUCTION

Diabetes mellitus is the commonest endocrine disorder in childhood . In Northern Europe and America, insulin dependent diabetes (IDDM) is third most frequent sever chronic disease of childhood, second only to asthma and cerebral palsy⁽¹⁾ The collection of sound epidemiological data from different geographical parts of the world is vital , if the puzzle of the pathogenesis of this disease is to be solved. The apparent enormous geographical variability of IDDM incidence has only recently been recognized,

diabetes in childhood increases in frequency with age but it can occur at any age. The incidence varies between different countries⁽²⁾ In Iraq there is no reported figures for the incidence on prevalence of IDDM .This work was carried out to study the clinical and epidemiological features of diabetes mellitus in children under 13 years of age in Thi-QAR city, and the impact of seasonality on age, sex, duration of symptoms and presence of diabetic ketoacidosis (DKA)

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SUBJECTS AND METHODS

Patients

Information on admissions of newly diagnosed children with IDDM (excluding those whose residency outside Thi-Qar city) over 5 years period at AL-Hussein Teaching Hospital and Maternity and Children Hospital, was obtained from the hospitals medical records and statistical departments from Jan.2003-Dec.2007 (inclusive). They met our criteria on the basis of age, month, season of diagnosis, the duration of symptoms between onset and diagnosis, residency (urban or rural), family history of IDDM and NIDDM, parental consanguinity, social class (based on father education, father occupation, housing, and monthly family income as designed by our department of community medicine), mode of clinical presentations, and the presence of any possible precipitating factors such as viral illness or psychological stress

Methods

All the patients were classified according to their age group into <1 years, 1-4 years, 5-8 years, and 9-12 years and their sex prevalence. Regarding seasonality, the patients were placed into one of two groups according to seasons of peak incidence (Winter and Autumn), epidemic group, and season of low incidence (Summer and Spring), non epidemic group.

Statistical analysis

Chi² technique was utilized to test the level of significance between variable with a $p < 0.05$ and a $p < 0.001$ as the lowest and highest level of significance respectively.

RESULTS

The frequency of newly recorded cases of IDDM was increasing in average during the period 2003-2007 in all age groups except under one year of age. Table.1. Out of 179 diabetic children studied, there was 100 (55.8%) males and 79 (44%) females. Male: female ratio was 1, 2:1. The youngest patient was 6 month old infant. There was male predominance and this fact becomes obviously clear and more with decreasing the age. The age at onset and sex are shown in table.2. There was bimodal age distribution at time of diagnosis the first peak at age group 6-7 years and the second peak at the age of 11 years. The first peak was almost equal in males and females, but the second was more among females. Fig.1. Regarding seasonal variation, most cases registered during Winter months (Dec., Jan., and Feb.) 60 cases (33.5%), the lowest number of cases presented in Summer months (May, Jun., and Jul.) 23 cases (12.8%). (fig.2). The prevalence of cases was more in epidemic for 111 (62%) than non-epidemic form 68 (38%) and within the epidemic form group, there was significant male predominance in all age groups ($p < 0.01$) except under 1 year of age. Family history (FH) for diabetes was positive in 81 (45%), in eleven (6,14%) F.H was positive for IDDM and in 70 patients (39%), FH was positive of NIDDM, and 18 (10%) of the familial cases were in the first degree relatives. The parental consanguinity rate was 22,2%. Sixty-two (34,6%) patients were from the upper, 57 (31,8%) from the middle and 60 (33,5%) from the lower social class. Most of our patients 104 (58%) were from urban areas, while those from rural areas were 75 (42%). The classical symptoms of polyuria, polydipsia and weight loss were present in 114 (63,6%). Diabetic

ketoacidosis (DKA) was the presenting symptom in 43 (24%) , five (11.6%) of whom were comatose .DKA was noticed to be commoner in epidemic from group 25 (58%) than non epidemic from group 18 (40,8%) .Nocturnal enuresis presented in 12 (6.7%) .Seven patients (3.9%) were diagnosed accidentally , 4 presented as urinarytract infection ,2 gastroenteritis and one presented with pneumonia . Table .4 .The interval between the onset and presentation was < I week in 78 (43,5%) , 1-2 week in 46 (25,6%) , 2-4 weeks in 42(23,44%) and > 1 month in 13 (7,2%) . The duration of symptoms being significantly shorter among those who presented during epidemic from than non- epidemic from (P = 0,05 df 418). Table .5.Thirty – two patients were had preceding illness or stress, 12(6.6%) was had history of upper respiratory tract infection 2-3 week prior to the onset of symptoms, 11 (6,1%) were had history of mumps 2-4 weeks prior to the onset of symptoms and 9 (5%) were had history of psychological trauma with an average of 2 weeks before the onset of symptoms.

DISCUSSION

IDDM is one of the commonest chronic illness of childhood and still carries considerable morbidity and mortality. (1) The age group studied was consistent with other studies (3,4,5) because the risk of developing IDDM is generally higher for this age group. In the present study , the frequency of newly recorded cases of IDDM was increasing in average in all age group except under 1 year of age. This could well be due to an increase of the incidence of the disease on perhaps reflects an improvement in the pediatrician performance and public awareness. In this study ,the age group of 1- 4 years represent the group of low frequency which is similar to that experienced from Oxford .(6) In our

study peaks of presentation occur in two age group at 5-8 year and 9-12 years of age. Comparable results were reported from Sweden,(7) Finland, (7) Oxford(6) ,and Sydney.(8) The first peak corresponds to the time of increased exposure to infections agents coincident with the beginning of school; the latter to the pubertal growth hormone secretion which antagonize insulin action and to the psychological stresses accompanying puberty . These possible cause – and effect relationships remain to be proved.(1)Sex ratio showed male predominance in all age groups and this fact became obviously clear and more with the decreasing age (table- 2) .Similar results were reported from Denmark(7), India(9),and Saudi ,Arabia(4) ,but was opposite to the experience from Baghdad(3)and UK(5). This male predominance could be explained on the observation that males are more prone to infection than female or could be due to genetic factors.The distribution of calendar months of diagnosis (fig.2.) was comparable to that reported from Baghdad (3) , Canada(10) ,and Austria.(11) This seasonal variation may suggest a possible etiological role of epidemic viral diseases.The family history of diabetes was positive in 81 (45%) of the cases . similar figures was reported from Saudi Arabia(4) ,and India(9) ,and in spite of our higher figure of the parental consanguinity rate (22.2%) the frequency of cases of IDDM in the first degree relative was similar to that reported from UK.(5)The difference in incidence of diabetic cases between urban and rural areas (58%,42% respectively) could be explained on the basis of stressful factors , exposure to toxic substances and difference in feeding habit in urban areas . The associations between socioeconomic status and IDDM incidence have been

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inconsistent. The result of this study was similar to other ⁽¹³⁾ which showed no difference in the frequency of IDDM occurrence in different socioeconomic classes. Most of our patients were presented with classical symptoms of IDDM (63,6%), comparable results reported previously ^(3,4,7). The incidence of DKA at onset tends to vary from one place to another. It is considered to be uncommon in Japan and Indonesia ⁽¹⁴⁾. Our figure of 24% is similar to previous Baghdad study ⁽³⁾, opposite to high Saudi Arabia ⁽⁴⁾ figure (55%). This could well be due to genetic factors or perhaps due to relatively late presentation and diagnosis. However; the interval from onset to diagnosis in our study was not much different from that which has been reported by others ^(3,4,9,12). The high incidence (43,5%) of short interval (<1 week) reflects better consideration of the symptoms by the parents and improving education of the population regarding diabetes mellitus, leading to earlier medical consultation. It is of interest to note that patients who presented during epidemic seasons have shorter duration of symptoms and more frequency of DKA than those who presented in non-epidemic seasons. From the observable difference in the two group we can conclude that IDDM evolve or at least is made manifest as an acute and sever problem in the epidemic but not as much in the non-epidemic patients. Antecental evidence for viral involvement in the etiology of IDDM is well documented ⁽¹⁵⁾. Nine (5%) were had a history of emotional stress prior to onset of symptoms this is much less from that observed by knowel et al (9%) ⁽¹⁶⁾. There is no direct evidence that this factor can cause diabetes and its more reasonable to assume that it influence the time of onset of diabetes

through catecholamine discharge and cortisol secretion. ⁽¹⁾

CONCLUSION

In this 5 years retrospective study:

*Diabetes mellitus is not uncommon illness among children in Thiqrar city

*The frequency of cases was increasing in all age group except under 1.

*Male predominance with the decreasing age

*A seasonal trend with shorter duration of symptoms, male predominance and more frequent of DKA among IDDM patients presented in epidemic seasons than those in non-epidemic, thus the pathogenesis of either of them may be different.

*Mumps was a possible precipitating or causative factor in 11 cases.

*Consanguinity rate was high (22.2%), but inspire of this high rate the relative risk of having another child with IDDM is low.

RECOMMENDATIONS

1)-We need further and bigger efforts to find out a reliable incidence and prevalence data for IDDM in persons less than 20 years in Iraq population and then to use this data base to study the impact of environmental factors with especial emphasis on changes in living conditions, panorama of viral infections, immunization practice, breast feeding habits and the socio – economic status through the establishments of an Iraqi Diabetic Association Registry with similar registries in other governorates and this need co- operation between pediatricians and physicians because many parents diabetic children consult physicians rather than pediatricians.

2)-further studies are needed to differentiate between epidemic and non-epidemic IDDM like islet cell. surface antibodies, C. peptide, HLA –type and viral studies

Table (1) Number of cases in relation with their ages of onset for the years from 2003 to 2007

| Age (years) | 1996 | 1997 | 1998 | 1999 | 2000 | Total |
|-------------|------|------|------|------|------|-------|
| Under 1 | 0 | 0 | 2 | 0 | 1 | 3 |
| 1- 4 | 5 | 6 | 8 | 8 | 7 | 34 |
| 5 -8 | 8 | 14 | 15 | 17 | 22 | 76 |
| 9- 12 | 10 | 14 | 11 | 13 | 18 | 66 |
| Total | 23 | 34 | 36 | 38 | 48 | 179 |

Table (2) The age of onset of IDDM and their sex distribution

| Age (years) | Male | | Female | | Total | |
|-------------|------|--------|--------|--------|-------|--------|
| | No. | (%) | No. | (%) | No. | (%) |
| Under 1 | 2 | (66,6) | 1 | (33,3) | 3 | (1-67) |
| 1-4 | 20 | (58,8) | 14 | (41,1) | 34 | (18-9) |
| 5-8 | 40 | (52,6) | 36 | (46,3) | 76 | (42-4) |
| 9-12 | 38 | (57,5) | 28 | (42,4) | 66 | (36,8) |
| Total | 100 | (55,8) | 79 | (44) | 179 | (100) |

Table (3) The seasonality and its relation with sex and age of diagnosis

| Age (years) | Epidemic | | | Non – Epidemic | | | Total No. |
|-------------|--------------|----------------|----------|----------------|----------------|-----------|-----------|
| | Male No. (%) | female No. (%) | Total No | Male No. (%) | female No. (%) | Total No. | |
| Under 1 | 1 (33,3) | 1 (33,3) | 2 | 1 (33,3) | 0 0 | 1 | 3 |
| 1 - 4 | 12 (35,2) | 8 (23,5) | 20 | 11 (32,3) | 3 (8,8) | 14 | 34 |
| 5 - 8 | 23 (30,2) | 22 (28,9) | 45 | 17 (22,3) | 14 (18,4) | 31 | 76 |
| 9 - 12 | 26 (39,3) | 18 (27,4) | 44 | 9 (13,6) | 13 (19,6) | 22 | 66 |
| Total | 62 (34,6) | 49 (27,3) | 111 | 38 (21,2) | 30 (16,7) | 68 | 179 |

P<0.01 DF 419

Table (4) Mode of presentation in relation to age groups

| Mode of presentation | 0- < 5 | | 5-<9 | | 9-<13 | | Total | |
|--|--------|--------|------|--------|-------|--------|-------|--------|
| | No. | (%) | No. | (%) | No. | (%) | No. | (%) |
| Classical symptoms polyuria , polydepsia | 17 | (14.9) | 65 | (57) | 32 | (28) | 114 | (63.6) |
| Ketoacidosis | 21 | (48.8) | 16 | (37.2) | 6 | (13.9) | 43 | (24) |
| Nocturnal enuresis | 3 | (25) | 8 | (66.6) | 1 | (8.3) | 12 | (6.7) |
| Convulsions | 2 | (66.6) | 1 | (33.3) | - | - | 3 | (1.6) |
| Accidental diagnosis | - | - | 5 | (71.4) | 2 | (28.5) | 7 | (3.9) |

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Table(5) Duration of symptoms in relation to seasonality of epidemic and non- epidemic groups

| Duration of symptoms (weeks) | Epidemic | | Non. Epidemic | | Total | |
|-------------------------------|------------|-------------|---------------|---------------|------------|--------------|
| | No. | (%) | No. | (%) | No. | (%) |
| < 1 | 57 | (73) | 21 | (26.9) | 78 | (43.5) |
| 1 - 2 | 26 | (56.5) | 20 | (43.4) | 46 | (25.6) |
| 2 - 4 | 20 | (47.6) | 22 | (52.3) | 42 | (23.4) |
| > 4 | 8 | (61.5) | 5 | (38.4) | 13 | (7.2) |
| Total | 111 | (62) | 68 | (37.9) | 179 | (100) |

P<0.05 , Df 418

Fig-1- Incidence of IDDM according to age sex

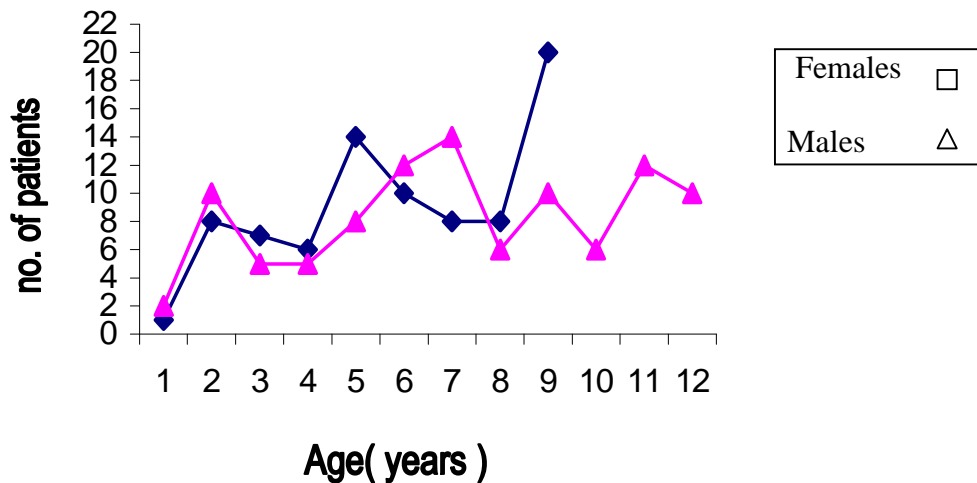
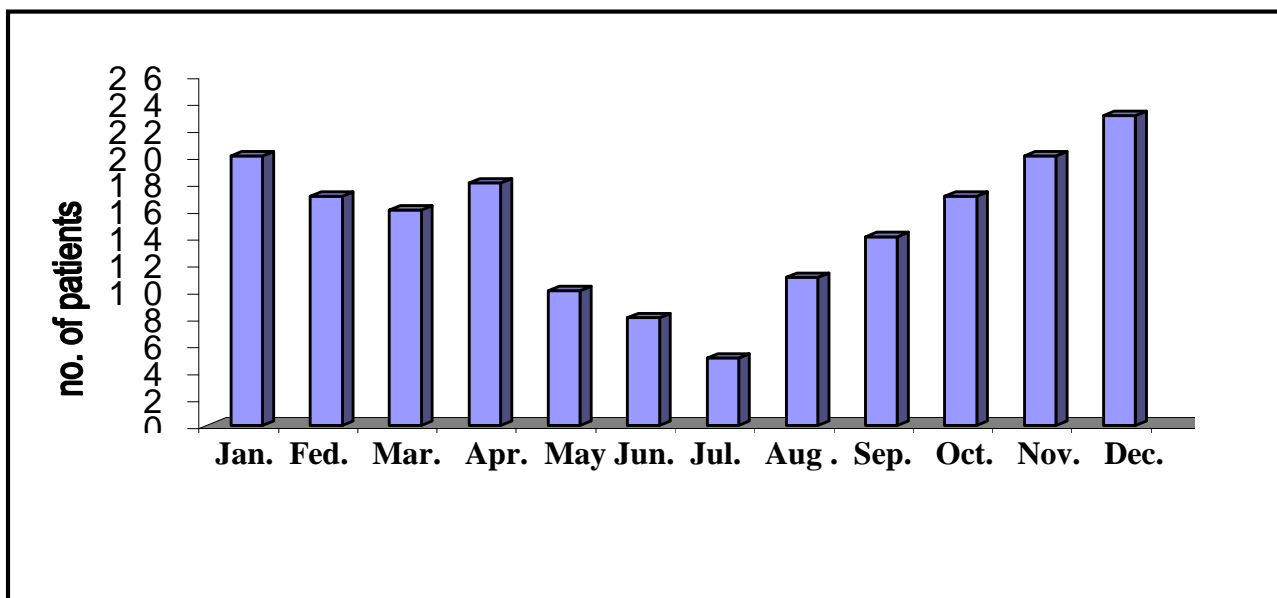


Fig -2- The distribution of calendar months of diagnosis



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داء السكري المنوط بالأنسولين لدى أطفال محافظة ذي قار

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قسم الأطفال / كلية الطب / جامعة ذي قار / ذي قار

الخلاصة

تم ادخال ١٧٩ مريضا سكريا حديثي التشخيص مصابين بالنمط (منوط بالانسولين) الى مستشفى الحسين التعليمي ومستشفى الولادة والاطفال في محافظة ذي قار - جمهورية العراق ، خلال خمسة اعوام للفترة من كانون الثاني ٢٠٠٣ ولغاية كانون الاول 2007 . كانت نسبة الغالبية العظمى ٣،٧٩ % تتراوح اعمارهم من ٥ - ١٢ سنة بينما كانت القلة ٦ ، ٢٠ % دون الخمس سنوات من العمر وكان عدد الحالات اكثر توترا مع ازدياد العمر . عدد الذكور كان ١٠٠ (٥٥،٨ %) وعدد الاناث كان ٧٩ (٤٤ %) ونسبة الذكور الى الاناث كانت ١،٢ : ١ وان التاريخ العائلي لمرض السكري كان ايجابيا عند ٨١ (٤٥ %) حالة . كما ان الغالبية كانوا من حضر ذي قار (٥٨ %) و (٤٢ %) من القرى المحيطة .

سريريا ، قدم ١١٤ مريضا بالأعراض المثالية لداء السكري منوط بالانسولين بينما قدم ٤٣ مريضا بصورة الحمض الكيتوني السريري ، وكان خمسة منهم مسيوتين وكان اكثر الحالات قد قدمت في فصلي الشتاء والخريف . وتميز مرضى هذا الفصول بسيادة الذكور على الاناث ، وقصر فترة الاعراض قبل التشخيص وارتفاع نسبة الحمض الكيتوني من الذين قدموا في الفصول الاخرى . وكان ٣٢ مريضا يعانون من امراض فايروسية او ازيمات نفسية لمدة ٢-٤ اسابيع قبل حدوث الاعراض . وهذا يتطلب دراسات اخرى لمعرفة مدى تأثير العوامل البيئية في احتمالية تسبب مرض السكري المنوط بالانسولين .