Newly diagnosed type 1 Diabetes Mellitus in Dhi-qar city(IRAQ) sociodemographic study

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Abstract
Objective : A comprehensive analytical study for representative sample of newly discovered type 1 diabetic patient aimed to assess the epidemiology and sociodemography of newly diagnosed type one DM in Dhi-qar province(southern of Iraq) in children <15 yrs of age .The present study also aimed to measure the educational level among those newly diagnosed T1DM through measuring the level of HbA1C and duration of illness before first presentation .
Methods :prospective cross sectional analytical study extended from February 2011 till December 2012 included 103 patients all of them newly diagnosed type one DM collected from diabetic center in Dhi-qar province
Result : there were 103 patients diagnosed for the first time during study period ,61 patients were males and 42 patients were females , 40% of patients presented on February &September .family history was positive only in 47 cases .breast feeding found only in 36%vs 62%in bottle feed patients.HbA1C level was high >8% for all cases .males patients showed significant low serum sugar than those in females patients .30%of rural areas resident presented with very high serum sugar >500mg /dl vs 3% in urban area.68% of patients presented with high BMI vs 25% presented with low BMI.
Conclusion ,HbA1C is good indicator for poor control and delayed presentation .Breast feeding is a good protective mechanism against T1DM. Rural area resident and female sex presented with high serum sugar at time of presentation .
Keyword : T1DM,poor control .HbA1C,delayed presentation

I. Introduction

Diabetes mellitus (DM) is a common chronic , metabolic syndrome characterized hyperglycemia as a cardinal biochemical feature. the major forms of diabetes are classified according to those caused by deficiency of insulin secretion due to pancreatic beta cell damage(type 1 DM , or T1DM) and those that are a consequence of insulin resistance occurring at the level of skeletal muscle ,liver and adipose tissue , with various degree of β cell impairment[8].

Morbidity and mortality stem from metabolic acute derangements and from long term complications that affect small and large vessels resulting in retinopathy ,nephropathy , neuropathy ischemic heart disease and arterial obstruction with gangrene of extremities[14,8]

DM is not a single entity but rather a heterogeneous group of disorders in which there are a distinct genetic pattern as well as other etiologic and pathophysiologic mechanism that lead to impairment of glucose tolerance[6]

Type 1 Diabetes Mellitus .

Formally called insulin dependent diabetes or juvenile diabetes .T1DM is characterize by low or absent level of endogenously produced insulin and dependence on exogenous Insulin to prevent development of ketoacidosis which acute life threaten complication of T1DM[8] .

The natural history include 4 stages

1-preclinical β cell autoimmunity with progressive defect of insulin secretion .

2-onset of clinical diabetes .

3-transient remission(honeymoon period) .

4-established diabetes associated acute and chronic complication and decrease life expectancy [14]

The onset occur predominantly in childhood with median age of 7-15 yrs. But it may present at any age .and this is compatible with this study .

T1DM associated with other autoimmune disease such as celiac, thyroditis ,multiple sclerosis and Addison disease[8]

The incidence of T1DM is rapidly increasing in specific regions and shows a trend toward earlier age of onset [15].T1DM account for about 10%of all diabetes affecting 15 million in the world [8]

Epidemiology :
- The incidence of T1DM is highly variable among different ethnic groups from 0.7/100000 in Pakistan to 40/100000 in Finland ([19]) and in Nassiryah diabetic center we have 825 registered patients since it is foundation (2008),
- In first yr.(192case in 2008),2009_144case(2010_145),(2011_145),(2012_149)and (2013_100 cases till June). (Dhiqar daibetic center statistics) . We see in {2008-2009} the highest no. of cases because ,the center is the first in the city so most cases of previous yrs. start to register in the first and second yrs. of center foundation .
- 347 million people worldwide have diabetes
- In 2004, an estimated 3.4 million people died from consequences of high fasting blood sugar
- More than 80% of diabetes deaths occur in low- and middle-income countries
- WHO projects that diabetes will be the 7th leading cause of death in 2030
- Healthy diet, regular physical activity& maintaining a normal body weight can prevent or delay the onset of diabetes.([9])

. Prevalence of diabetes in Iraq was estimated to be 10.2 per cent in 2010. This estimate exceeded total prevalence in the Middle East and North Africa region (9.3%) and is (nearly) equivalent to that of the USA (10.3%).([4])

Predisposal factor can be summarized by the following:

1-autoimmune disease

2-viral infection especially congenital rubella .

3-genetics like HLA

4-obesity

5-disease of pancreas

6-Race/ethnicity: Certain ethnicities have a higher rate of type 1 diabetes. In the United States, Caucasians seem to be more susceptible to type 1 than African-Americans and Hispanic-Americans. Chinese people have a lower risk of developing type 1, as do people in South America([5])

7-Geography: It seems that people who live in northern climates are at a higher risk for developing type 1 diabetes. It's been suggested that people who live in northern countries are indoors more (especially in the winter), and that means that they're in closer proximity to each other—potentially leading to more viral infections.([5])

8- Family history: Since type 1 diabetes involves an inherited susceptibility to developing the disease, if a family member has (or had) type 1, you are at a higher risk.

If both parents have (or had) type 1, the likelihood of their child developing type 1 is higher than if just one parent has (or had) diabetes.

9- Early diet: Researchers have suggested a slightly higher rate of type 1 diabetes in children who were given cow's milk at a very young age.([5])

Environment : childhood T1DM .was uncommon in the 1st half of the 20th century , but it is incidence has risen rapidly over the past 50 yrs([8])

Factors such as chemicals ,infection as well as seasonality and geographic locations have been suspected of contributing to differences in the incidence and prevalence of T1DM in various ethnic populations([14])

Viral infections and vaccinations : in spite of many viral infection can effect beta cell of pancreas such as coxsachie B4,B3,CMV,rubella and mumps only congenital rubella infection is associated with diabetes in later life. The diabetes induced by rubella resembles T1DM because it is associated with HLA –DR3&DR4 and it is mediated by immune responses against β cell antigens([8])

Seasonal association . newly recognized cases appear with greater frequency in the respective autumn and winter months in the northern & southern hemispheres . seasonal variation mostly apparent in the adolescent years .

Puberty :the pubertal peak in onset of type 1DM occur earlier in girls than boys this is may be due to estrogen or by genes regulated by estrogen ,such as the interleukin-6(IL-6)gene.([8,18])

Dietary factors: An initial exposure of infants to cereals before 4 months of age or after 6 months of age has been suggest to increase risk of islet a autoimmunity independent of HLA genotype, family history of T1DM,ethinicity and maternal age . ([6])

Body mass index: there may be a greater risk of T1DM among individuals who were heavier as young children (the accelerator hypotheses -that suggest the age at

Chemicals :Drugs such as alloxan, streptomycin (STZ) pentamidine and Vacor are directly cytotoxic to β cell and cause diabetes in experimental animals and humans([6,12]) diagnosis and treatment:

Diabetes is diagnosed with the following blood tests:
- Fasting blood glucose level -- diabetes is diagnosed if it is higher than 126 mg/dL two times
- Random (non fasting) blood glucose level -- you may have diabetes if it is higher than 200 mg/dL, and you have symptoms such as increased thirst, urination, and fatigue (this must be confirmed with a fasting test)
- Oral glucose tolerance test -- diabetes is diagnosed if the glucose level is higher than 200 mg/dL after 2 hours
- Hemoglobin A1c test
  - Normal: Less than 5.7%
  - Pre-diabetes: Between 5.7% and 6.4%
  - Diabetes: 6.5% or higher[6,12]

Treatment »

Because type 1 diabetes can start quickly and the symptoms can be severe, people who have just been diagnosed may need to stay in the hospital.

If you have just been diagnosed with type 1 diabetes, you should probably have a check-up each week until you have good control over your blood sugar. Your health care provider will review the results of your home blood sugar monitoring and urine testing. Your provider will also look at your diary of meals, snacks, and insulin injections.

As the disease gets more stable, you will have fewer follow-up visits. Visiting your health care provider is very important so you can monitor any long-term problems from diabetes.

You are the most important person in managing your diabetes. You should know the basic steps to diabetes management:
- How to recognize and treat low blood sugar (hypoglycemia)
- How to recognize and treat high blood sugar (hyperglycemia)
- Diabetes meal planning
- How to give insulin
- How to check blood glucose and urine ketones
- How to adjust insulin and food when you exercise

INSULIN

Insulin lowers blood sugar by allowing it to leave the bloodstream and enter cells. Everyone with type 1 diabetes must take insulin every day.

Insulin is usually injected under the skin. In some cases, a pump delivers the insulin all the time. Insulin does not come in pill form.

Insulin types differ in how fast they start to work and how long they last. The health care provider will choose the best type of insulin for you and will tell you at what time of day to use it. More than one type of insulin may be mixed together in an injection to get the best blood glucose control. You may need insulin shots from one to four times a day.

Your health care provider or diabetes nurse educator will teach you how to give insulin injections. At first, a child's injections may be given by a parent or other adult. By age 14, most children can give their own injections.

People with diabetes need to know how to adjust the amount of insulin they are taking:
When they exercise
- When they are sick
- When they will be eating more or less food and calories
- When they aretraveling[6]

Diabetes recently can monitored and predicted by HbA1C which is glycosylated type of hemoglobin as I did in my study because glycohemoglobin is formed progressively and irreversibly in the erythrocyte during it is 120 –days life, the red cell glycohemoglobin concentration is dependent on the average blood glucose concentration over a period of weeks and is stable for life of the cell ,therefore ,measurement of glycohemoglobin, as a percent of total hemoglobin ,provide a valuable method for assessing the long term control of diabetes ,since glygohemoglobin levels approach normal values as diabetic respond to treatment [7] the HbA1C test is a simple lab .test that show the average amount of sugar in the blood over the last 2-3 months it is best way to find out if blood sugar under control .[7].HbA1C was introduced into clinical use in 1980s and subsequently has become a cornerstone of clinical practice [20]

Aim of study :
1- To assess the educational level of the patient-family about T1DM control by measuring the level of HbA1C in patients serum .
2- To examine the relationship between the type of feeding and gender with development T1DM in children .
3-To assess the relationship between development of T1DM and pattern of living (residency ,diet, accommodation ,daily activity ………etc)

II. Methodology

Type of study: A prospective cross sectional analytical study extended from(beginning of February 2011 till the end of December 2012

studied population: including 103 cases of newly discovered T1DM: 61 of them were males and 42 were females..

Sampling and sample size:
a simple random sample was selected during my work in diabetic center and Bint elhuda teaching hospital for one day per week and only newly diagnosed T1DM cases were selected that is why we collect only 103 cases during one year study.

Ethical consideration :as the study conducted in pediatrics age group ,the parent of all children asked for permission to do lab .investigation as well as history taken to perform the study .

Data collection: collected from diabetic center in Nassiryia and Bint- Elhuda teaching hospital for maternity and children .in Dhi-qar province (1,930.000population southern of Iraq {health information department in Dhi-qar health directorate })

Tools of the study:
1-direct interview(specific questionnaire forma include name , age, sex ,date ,duration of illness ,family history of DM, treatment taken ,history of infectious disease like mumps ,rubella ,parent education)
2-clinical examination which include height ,weight to find body mass index and
3-laboratory investigation include serum sugar ,urine sugar and HbA1C.
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Data analysis :
The data analyzed by using statistical package of social science (SPSS) version (19) by which we estimate the mean and standers deviation and chi-square test to study the association of different variables

III. Result & discussion
Table (1): Socio-demographic characteristics(age distribution)

Characteristic	Frequency	Percent
Age		
Less than 5 years	21	20.4
From 5 up to less than 8 years	30	29.1
From 8 up to less than 11 years	36	35.0
From 11 up to less than 14 years	9	8.7
Fourteen years or above	7	6.8
Sex		
Male	61	59.2
Female	42	40.8
Address		
Urban	79	76.7
Rural	24	23.3
Total	103	100.0

Most cases occurred between 8-11yrs. of age followed by 5-8 yrs.
Table (2) show distribution of cases according to duration of illness

Duration of illness	No. of cases	Percent
<7 days	26	25.4%
7-14 days	28	27.1%
15-20 days	24	23.3%
21-29 days	5	4.8%
>30 days	20	19.4%
Total	103	100

In this table we see the duration 7-14 days occupy the highest percent followed by <7 day and 15-20 days respectively, then >30 days represent about 20% of total cases

Table (3): Family history of DM

Family history	Frequency	Percent
Positive	49	47.6
Negative	54	52.4
Total	103	100.0

Table (4): Type of feeding

Type of feeding	Frequency	Percent
bottle feeding	64	62.1
Breast feeding	37	35.9
Mixed	2	1.9
Total	103	100.0

this table showed large proportion of patient with bottle feed(62%) exposed to DM while 36% of breast feed have DM.

Table (5): distribution by their Random Blood Sugar Level

Level of RBS	Frequency	Percent
From 200 up to 300 mg/dl	32	31.1
From 301 up to 400 mg/dl	33	32.0
From 401 up to 500 mg/dl	29	28.2
More than 500 mg/dl	9	8.7

In the above table we see the first 3 category nearly equal except the last category (>500mg) have a less percent.

Table (6): distribution by their sugar in urine

Level	Frequency	Percent
+	4	3.9
++	29	28.2
+++	42	40.8
++++	28	27.2
Total	103	100.0

In this table we see urine sugar at time of presentation we notice most cases presented +++ and ++++ pluses and indicate also delayed presentation and high serum sugar and this reflect the background and educational level of the patients .

Table (7): Distribution of the study population according to body weight(BMI) at time of presentation

Weight	Frequency	Percent
Underweight	26	25.24
Normal	7	6.80
Overweight	70	67.96
Total	103	100.0

This table showed majority of the cases are overweight at time of presentation and this is usual and compatible with international data because T1DM mostly occur in obese patients.

Table (8): Age group & RBS Level

Age group	RBS Level				Total
	From 200 up to 300 mg/dl	From 301 up to 400 mg/dl	From 401 up to 500 mg/dl	More than 500 mg/dl	
Less than 5 years	6	8	5	2	21
	28.6%	38.1%	23.8%	9.5%	100.0%
From 5 up to less than 8 years	12	7	11	0	30
	40.0%	23.3%	36.7%	.0%	100.0%
From 8 up to less than 11 years	8	15	6	7	36
	22.2%	41.7%	16.7%	19.4%	100.0%
From 11 up to less than 14 years	4	3	2	0	9
	44.4%	33.3%	22.2%	.0%	100.0%
Fourteen years or above	2	0	5	0	7
	28.6%	.0%	71.4%	.0%	100.0%
Total	32	33	29	9	103
	31.1%	32.0%	28.2%	8.7%	100.0%

P-value= 0.036

Table(9) level of HbA1C

Normal range	4.2-6.2%	0
Diabetic (good control)	5.5—6.8%	0
Fair control	6.8—7.6%	0
Poor control	Above 7.6%	103

In this table we see all cases presented with high level of HbA1C above 7.6% which indicate poor control and high serum sugar and this is generally reflect the low level of health knowledge about this disease and because all cases had poor control so we could not find statistical association .

Table (10) showed relationship between sex and level of serum sugar

Sex	RBS Level				Total
	From 200 up to 300 mg/dl	From 301 up to 400 mg/dl	From 401 up to 500 mg/dl	More than 500 mg/dl	
Male	18	21	13	9	61
	29.5%	34.4%	21.3%	14.8%	100.0%
Female	14	12	16	0	42
	33.3%	28.6%	38.1%	.0%	100.0%
Total	32	33	29	9	103
	31.1%	32.0%	28.2%	8.7%	100.0%

In this table we notice that level of serum sugar at presentation slightly high in female , about 40% present with serum sugar 400-500 mg /dl while in male about 30% present with serum sugar 200-300 mg /dl and this is may be explained by education level of males little pit higher than females especially in rural areas

Table (11)showed relationship between address and level of serum sugar

Address	RBS Level				Total
	From 200 up to 300 mg/dl	From 301 up to 400 mg/dl	From 401 up to 500 mg/dl	More than 500 mg/dl	
Urban	24	28	25	2	79
	30.4%	35.4%	31.6%	2.5%	100.0%
Rural	8	5	4	7	24
	33.3%	20.8%	16.7%	29.2%	100.0%
Total	32	33	29	9	103

Address	RBS Level				Total
	From 200 up to 300 mg/dl	From 301 up to 400 mg/dl	From 401 up to 500 mg/dl	More than 500 mg/dl	
Urban	24	28	25	2	79
	30.4%	35.4%	31.6%	2.5%	100.0%
Rural	8	5	4	7	24
	33.3%	20.8%	16.7%	29.2%	100.0%
Total	32	33	29	9	103
	31.1%	32.0%	28.2%	8.7%	100.0%

Table (12): Relationship between Family history of DM & RBS Level

Family history of DM	RBS Level				Total
	From 200 up to 300 mg/dl	From 301 up to 400 mg/dl	From 401 up to 500 mg/dl	More than 500 mg/dl	
Positive	19	14	9	7	49
	38.8%	28.6%	18.4%	14.3%	100.0%
Negative	13	19	20	2	54
	24.1%	35.2%	37.0%	3.7%	100.0%
Total	32	33	29	9	103

Table (13) distribution of cases according to time of occurrence

Months	Frequency	Percent
January	10	9.7%
Faberuary	**22**	21.3%
March	6	5.8%
April	4	3.8%
May	6	5.8%
June	4	3.8
July	10	9.7
August	8	7.7%
Sep.	**18**	17.4%
Oct.	9	8.7%
November	4	3.8%
December	2	1.9%
Total	103	100

In this table we see most of cases presented in February and September (winter and fall) and this is compatible with international data

Table (14):Relationship between type of feeding and RBS Level

Feeding	RBS Level				Total
	From 200 up to 300 mg/dl	From 301 up to 400 mg/dl	From 401 up to 500 mg/dl	More than 500 mg/dl	
Bottle Feeding	7	25	17	15	64
	10.9%	39.1%	26.6%	23.4%	100.0%
Breast feeding	18	7	10	2	37
	48.6%	18.9%	27.0%	5.4%	100.0%
Mixed	0	0	2	0	2
	.0%	.0%	100.0%	.0%	100.0%
Total	25	32	29	9	103
	24.2%	31.0%	28.2%	16.5%	100.0%

In this table we see relationship between serum sugar and type of feeding .we see (aboute40%)while 48%of breast feed children present with serum sugar 300-400mg/dl and this variation not so much significant

IV.   Discussion

Limitation of study : as the selected cases were only recent cases (newly discovered) the sample was small size in addition to some difficulties in data collection like history of childhood infectious disease, because the family either do not remember or can not give accurate diagnosis of infectious diseases .also determination of illness duration was not so accurate as it depend on patient relative and they can not give clear cut of DM manifestation .

In table(one) we notice the sociodemographic distribution of the cases , we see (35%) occur between 8-11-yrs.old age group followed by 5-8 yrs age group and this is compatible to international data and study done in Kuwait ([11])

While sex distribution showed nearly equal distribution with slight male predominance and this is also compatible to WHO and SHALTOOT et al .([11,19]).regarding address we see most cases(>2/3rd) came from rural areas and this is could be explained by life style and educational level about the disease like poverty and neglection .

In table (2) show distribution of cases according to duration of illness before presentation in which we see variable durations but 1-2 wks. Is the highest followed by less than 7 days and more than 30 days respectively , so we see about 1/3rd of cases presented beyond one month and this is a long duration and this is also related to patient background about the disease manifestation and complications for which we need special programs for health education and promotion.

In table (3) we see distribution of cases according to the history of DM in the family as we mentioned in the introduction there is strong relationship between development of T1DM and same disease in the family particularly if both parent have DM,([5]) but in our study the ratio approximately equal.

In the table (4) we notice the relationship between type of formula feeding in infancy and development ofT1DM later on ,we see more than 60% of patients with bottle feed developed T1DM as compared to 36% of breast feed .and this is significantly encouraging future study to support this study and encourage breast feeding in infancy as protective tool against T1DM .

In the table (5) we see the level of serum sugar at time of presentation as a first time. we see the first categories approximately equal, but about 60% presented with serum sugar between 300-500mg /dl and this significantly high percent and indicate delayed presentation and those mostly came from rural areas and this is either due to neglection or pass unnoticed due to poor education .

In the table (6) we see distribution of cases by the level of sugar in their urine we see the highest percent 42% presented with three pluses and about 30% present with 4 pluses as a first presentation and this is also indicate delayed consultation and treatment as plasma sugar correlate positively with urine sugar.

In the table (7)we see the distribution of study population according to the body mass index(BMI) at time of presentation ,we see most cases presented with high BMI and this is compatible to pediatrics textbooks and study done in Kuwait SHALTOOT et al ([11])but a study done in Turkey Ozgul Tunc et al showed only 4.4% have high BMI([10]) . And 25% presented with low BMI and underweight due to delayed presentation

In the table (8) in this table we see relationship between level of serum sugar and age groups .

In age group <5 yrs .we see most cases (about 90%) of cases present with serum sugar ranging between 200mg/dl -400mg/dl and this is explained either by delayed presentation due to subtle manifestation of DM and pass unnoticed by the family or family refuse treatment as chronic illness .

In age group 5-8 yrs. we see 40% of cases present with serum sugar between 200mg/dl-300mg /dl and this may explained by awareness of patient in such age to DM manifestation.

While in age group 8-11 yrs. we see 41% of cases which is highest percent in this group present with serum sugar 300mg/dl-400mg /dl and delayed presentation may be the manifestation and weight loss explained child activity and growth surge and change in body contour due to hormonal changes in such age .

In age group 11-14 yrs . we see most cases 44% presented with serum sugar 200 mg/dl -300mg /dl and this indicate early presentation and could be due to patient and family awareness in such age and knowledge acquisition about DM manifestation .

Regarding last age group >14 yrs. of age we see majority of cases presented with high serum sugar 400-500 mg /dl and this indicate patient neglection as he start self dependence .

In table (9) .showed the level of HbA1C which is above 7%(abnormal) for all cases at time of first presentation in newly diagnosed T1DM which indicate poor control an

In the table (10) we see the relationship between Sex and serum sugar level and we see more than 60% of males presented with serum sugar between 200-400mg/dl while more than 60%of females presented with serum sugar between 300-500mg /dl that is mean males presented earlier than females with significant P-value(0.028) and this is explained by adolescent male aware and oriented about the disease more than adolescent females and families take care about males more than females (cultural issue).

In the table (11) we see the relationship between address and level of serum sugar so we see about 30% of rural areas resident presented with serum sugar more than 500mg/dl as compared to only 2.5% of urban areas and

statistically significant with P.Value(0.001), and this could be explained by neglection and education level in rural areas less than that of urban one ,transportation difficulties and shortage of medical supplies in these areas. In the table (12) we see the relationship between family history of DM and level of serum sugar which is statistically significant with P-value 0.036 we see more than 67% of those with positive family history presented with low serum sugar(200-400mg /dl) and presented earlier than those of negative family history in whom more than 70% presented with serum sugar 400-500mg /dl .and this explained by orientation of the patients and the families about the disease manifestation as they gained much more experience and became familiar with the disease symptoms .

In the table (13)we see distribution of cases according to time of occurrences .we see most cases presented in winter & autumn times (36.7%) and(25.1 %) respectively and this is compatible with international data.

In the table (14)we see the relationship between type of feeding and level of serum sugar and this also statistically significant with P-value(0.030) and we see about 50% of breast feed cases patients present earlier and only 5.4% present with high serum sugar more than 500mg/dl while in bottle feed patients about 40% of cases present with serum sugar 300-400mg /dl and 23.4% present with serum sugar more than 500mg /dl ,so breast feeding significantly affect the course of disease and ameliorate the DM symptoms .

 Generally we see most cases had a delayed presentation came from rural areas   and some of them presented with ketoacedosis ,male to female ratio slightly equal with slight male predominance ,family history is significantly affect the course of the disease , as bottle feeding found in 60 % of cases ,these finding has created substantial scientific and public interest and had led to several claims that variety of proteins in cow`s milk are immunogenic determinants of type one DM .but Anette-G.Ziegler et al in his study found no much differences  between cow`s and breast feed infants .([18])

Regarding infectious disease we found only two patient exposed to measles and mumps which is insignificant (1.9%) of total cases .regarding seasonal variation about 40% of cases occurred mainly in winter season (Feb .& Sep.) while in Nanees A.Ismail et al ,Egyptian study done in Ain Shams university showed most cases occurred in summer time ([22]).

V.   Conclusion

1-We can conclude that T1DM increasing incidence   in the last 5 yrs in ALNassiryah   city .

2- Most cases of newly diagnosed T1DM presented with high serum sugar and ketoacedosis .due to absence of health education and promotion programs .

3- Breast feeding in infancy is a protective tool against T1DM

4-Male patients presented earlier than females .

5-Rural areas resident patients presented with high serum sugar than urban one .

6-Patients with positive family history of DM present with low serum sugar as compared with those of negative family history of DM

7-HbA1C is a good indicator for control and duration of illness in newly diagnosed

   T1DM.

Recommendations :

1-Implementaion of health programs regarding T1DM including education and promotion using local media ,boosters, hospital journals ……etc.

2-Encourage breast feeding in infancy

3-Activate school health to start programs supported by ministry of health to screen primary and secondary schools for T1DM.

4-Try to implement a program including health visit for remote areas(rural)for T1DM screening.

Acknowledgement :

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