

## Management Of Juvenile Diabetes

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### Abstract

Type 1 Diabetes is called Juvenile Diabetes as the onset of it begins in childhood. Children diagnosed with juvenile diabetes are insulin dependent. Current research indicates that juvenile diabetes is an auto-immune disorder. Aim was to assess management, treatment and control of type 1 diabetes in children. This was a retrospective study. A total of 40 patients with type 1 diabetes were observed in the out patient department of The Children's Hospital Lahore between the period of 28 June 2010 to 21 July 2010. Out of 40 patients, 43% taking combination therapy of humulin N and humulin R, 47% showed poor dietary compliance, 39% used to face hypoglycemic attacks between 1-3 per month, 40% showed poor control on diabetes on the basis of Hb1C test. Color of urine of majority of patients (50%) became yellow after performing Benedict's test which showed that most of patients coming to children hospital had high amount of ketones in urine. The daily intake of food should also be monitored. The primary goal of any dietary plan for diabetes is to maintain levels of glucose in the blood. The way of injecting insulin was not as proper as should be and thus the use of insulin injection was ineffective as treatment. Right now, there's no cure for diabetes, so kids with type 1 diabetes will need treatment for the rest of their lives. But with proper care, they can look and feel healthy.

**Key words:** *juvenile diabetes, auto-immune disorder, insulin and dietary compliance.*

### INTRODUCTION

The incidence of Type I diabetes is increasing worldwide both in low and high incidence populations. By the year 2010 the incidence will be 50 per 100 000 a year in Finland and also in many other populations it will exceed 30 per 100 000 a year. [1]

Low incidence and prevalence rates of childhood type 1 diabetes were recorded in several countries over the period 1920–1950, and one carefully performed study showed no change in childhood incidence over the period 1925–1955. Steep rises in the age-group under 5 years have been recorded recently. [2]

Diabetes as a pediatric entity is not uncommon, since it has been found that 5 to 5.7 percent of all persons with diabetes have the onset of their disease during the first decade of life. However, its incidence decreases directly with the decrease in the age period studied. Of a group of 750 patients with juvenile diabetes studied by White, 16 per cent were found to have had the onset before the age of 4 years, whereas the disease occurred before the age of 1 year in only 0.5 per cent. [3]

It is well known that acute infections lead to difficulty in controlling blood sugar levels and that infection is the most frequently documented cause of ketoacidosis. There is a significant diminution in intracellular bactericidal activity of leukocytes with *Staphylococcus aureus* and *Escherichia coli* in subjects with poorly controlled diabetes in comparison with the control group. Good control of blood sugar in diabetic patients is a desirable goal in the prevention of certain infections and to ensure maintenance of normal host defense mechanisms that determine resistance and response to infection. [4]

Data on glycemic control provide sufficient evidence that self-management education is effective in community gathering with type 1 diabetes. Evidence is insufficient to assess the effectiveness of self-management education interventions at the worksite or in summer camps for either type 1 diabetes. Evidence is also insufficient to assess the effectiveness of educating coworkers and school personnel about diabetes. [5]

Some children with diabetes remain at high risk for ketoacidosis and severe hypoglycemia. Age- and sex-specific incidence patterns suggest that ketoacidosis is a challenge in adolescent girls while severe hypoglycemia continues to affect disproportionately the youngest patients and boys of all ages. The pattern of modifiable risk factors indicates that underinsured children and those with psychiatric disorders or at the extremes of the HbA<sub>1c</sub> distribution should be targeted for specific interventions. [6]

Many children with type 1 diabetes have poor glycaemic control. Since the Diabetes Control and Complications Trial (DCCT) showed that tighter control reduces complication rates, there has been more emphasis on intensified insulin therapy. Parents of children with Type 1 diabetes reported considerable parental fear of hypoglycaemia, affecting both parental health and quality of life. There is some suggestion that hypoglycaemia avoidance behaviours by parents might adversely affect glycaemic control. Trials of interventions to reduce parental anxiety and hypoglycaemia avoidance behaviour are needed. We suggest that there should be a trial of structured education for parents of young children with Type 1 diabetes.[7]

Annual screening in our Paediatric Diabetic population has identified elevated cholesterol levels in 25% of T1DM children between 12 and 18 yrs, and in a smaller but notable proportion of those with T1DM <12 yrs of age. Importantly, rising HbA<sub>1c</sub> levels are associated with increasingly severe hypercholesterolaemia, and this trend was clear in both children of 12–18 yrs and children <12 yrs of age with T1DM. Our findings support the practice of annual screening for lipid disorders in children with type 1 DM, and highlight the association between poor glycaemic control and hypercholesterolaemia, not only in children of 12–18 yrs but also in the younger Diabetic population.[8]

Conducting child- and parent-centred qualitative research allows exploration of the perceptions and understanding of type 1 diabetes mellitus and the meaning ascribed by

children and their parents who live with the condition. Diabetes is a lifelong, life-threatening condition that has a significant impact on children's and parents' lives. Developing a deeper understanding of their lives and experiences will enable the delivery of nursing care to meet their specific needs. [9]

## MATERIALS AND METHODS

Forty patients with type 1 diabetes were observed in the out patient department of The Children's Hospital Lahore between the period of 28 June 2010 to 21 July 2010 were studied. Children from 2 to 16 years of both gender were included in the study and children with celiac disease are excluded from our study. A 'questionnaire' and retrospective type of study was done to evaluate management, treatment and control of diabetes in children to focus their health for living a better life and to enjoy all happiness of normal healthy life. A 'questionnaire' was filled by direct interviews which reveal the effects of various factors on diabetes. The questionnaire having different questions about the task was designed. In the light of the answers to the questions, physical comparison of claims and data with ground realities was made. The data from these questions were tabulated and the result was presented in the form of graphs.

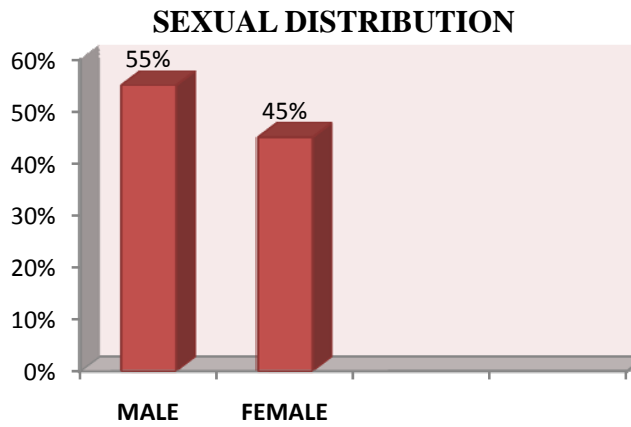
## RESULTS

Forty patients having complaint of juvenile diabetes and various aspects of patients were studied.

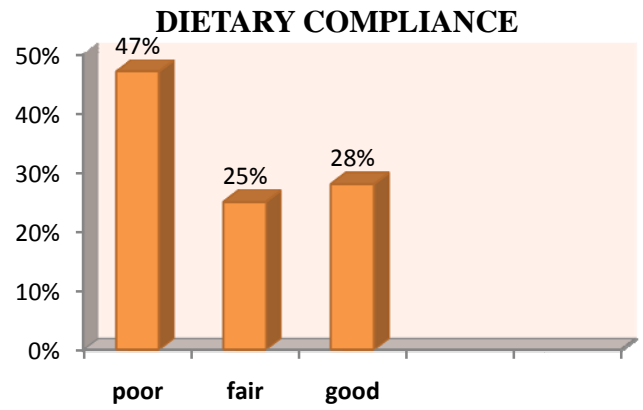
Figure 1 shows that juvenile diabetes was present in 55% in male and 45 % in females. This is a evidence that diabetes is more common in male patients than females.

Figure 2 reveals that (20%) patients were found between Age from 1month-5years, (42%) were found among age from 6-10years and (38%) patients were found of age among 11-16years. It shows that mean age of having diabetes in children is present within 6-10yrs range.

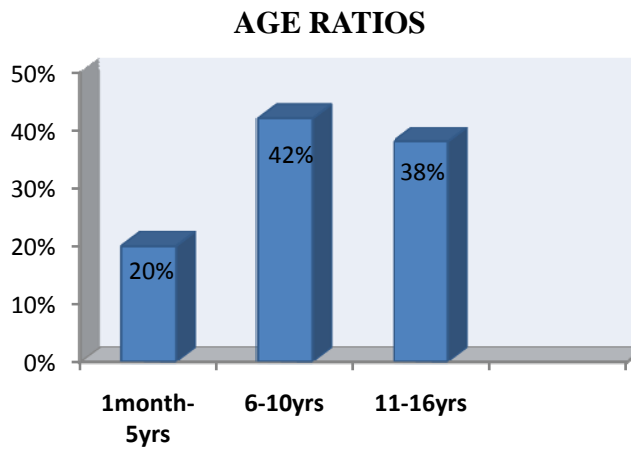
Figure 3 shows that 47% patients had poor dietary compliance, 25 % had fair while 28% patients had good dietary compliance.



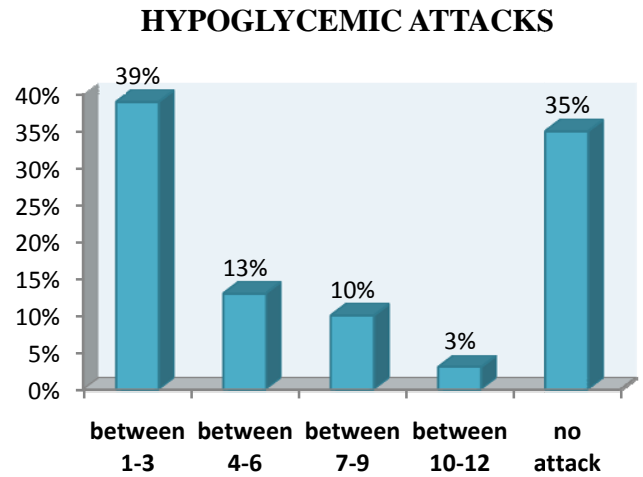
**Fig. 1.**



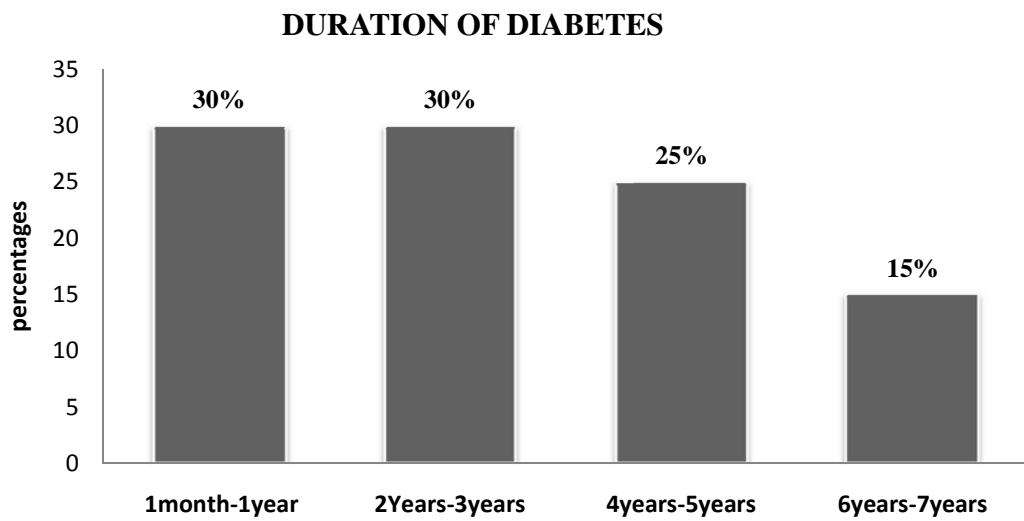
**Fig. 3.**



**Fig. 2.**



**Fig. 4.**



**Fig. 5.**

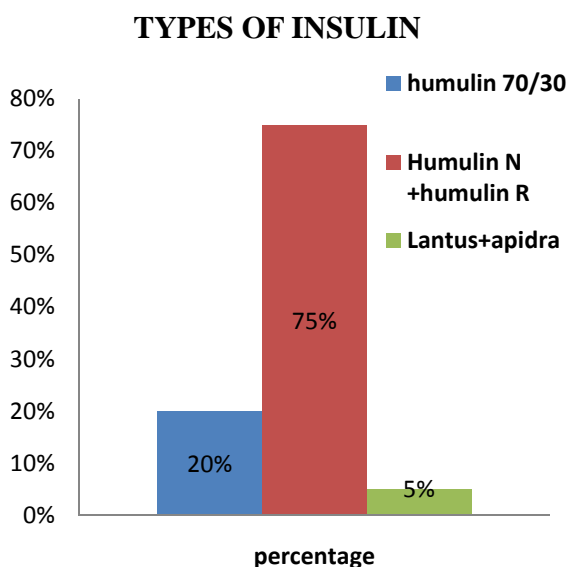


Fig. 6.

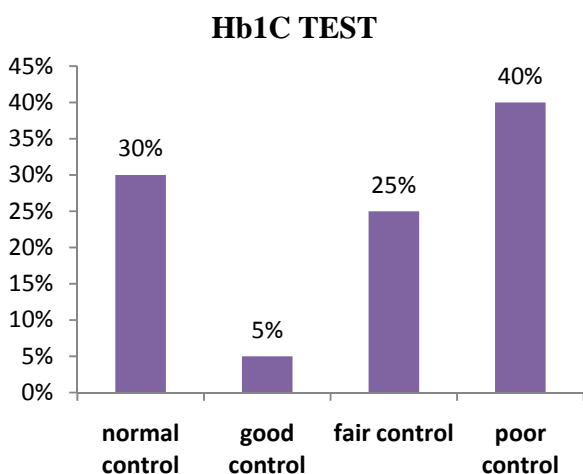


Fig. 7.

Dietary compliance of majority patients was poor due to which they were not able to control diabetes in a proper way.

Figure 4 reveals that majority of patients used to face hypoglycemic attacks between 1-3 per month (39%), some patients had hypoglycemic attacks between 4-6 per month (13%) and some other had hypoglycemic attacks between 7-9 per month (10%). As the diet intake was in an improper manner, diabetic patients had to face hypoglycemic attacks because they did not follow diet chart guided by the dietitian.

Figure 5 shows that 30% patients had diabetes since 1month-1year, 30% had diabetes since 2-3years, 25% patients had diabetes since 4-5years, 15% had diabetes since 6-7years.

Figure 6 shows that 75 % patients were prescribed to use combination of humulin N and humulin R, 20% patients were using humulin 70/30 and 5% using apidra and lantus for treatment of type 1 diabetes depending on needs of patient.

Figure 7 reveals that Hb1C test of 40% patients showed poor control on their diabetes. 30% showed normal control on diabetes and 25% showed fair control. A normal HbA1c range is between 4 - 6% .

### DISCUSSION

Type 1 diabetes is the most common form of diabetes in children: 90-95 per cent of under 16s with diabetes have this type. In type 1 diabetes, the body can no longer make insulin, so the glucose can't get into the body's cells. This causes the blood glucose level to rise. The diagnosis of diabetes in children requires a careful review of a child's current and past medical history, family history, physical examination and specialized testing. Type 1 diabetes testing include the Glycated hemoglobin (Hb1C) test, Random blood sugar test and Fasting blood sugar test. The presence of ketones in urine also suggests type 1 diabetes. Treatment for type 1 diabetes is a lifelong commitment to taking insulin, exercising regularly, maintaining a healthy weight, eating healthy foods and monitoring blood sugar regularly. There are many types of insulin which include rapid-acting insulin, long-acting insulin and intermediate acting insulin. Depending on needs of patient, doctor may prescribe a mixture of insulin types to use throughout the day and night. Low blood sugar (hypoglycemia) occurs when blood sugar level drops below target range. Blood sugar levels can drop for many reasons, including skipping a meal, getting more physical activity than normal or injecting too much insulin. Parents of any child who has juvenile diabetes should follow the treatment recommendations of patient's health-care provider.

## CONCLUSION

Treatment goals for children with type 1 diabetes are to control the condition in a way that minimizes symptoms, prevents short- and long-term health problems, and help them to have normal physical, mental, emotional, and social growth and development. To do this, parents and kids should aim for the goal of keeping blood sugar levels as close to normal as possible. In general, kids with type 1 diabetes need to take insulin as prescribed, eat a healthy, balanced diet, paying special attention to the amount of carbohydrates in each meal and the diabetes meal plan, monitor blood sugar levels several times a day and get regular physical activity. Following the treatment plan helps kids stay healthy, but treating diabetes isn't the same as curing it. Right now, there's no cure for diabetes, so kids with type 1 diabetes will need treatment for the rest of their lives. But with proper care, they can look and feel healthy .

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## REFERENCES

- [1]. P. Onkamo, S. Väänänen , M. Karvonen and J. Tuomilehto. 1999 Worldwide increase in incidence of Type I diabetes--the analysis of the data on published incidence trends. *Diabetologia* 2000 May;43(5):685.
- [2]. Edwin A.M. Gale 2002. The Rise of Childhood Type 1 Diabetes in the 20th Century
- [3]. Joseph Schwartzman, M.D.; Margaret E. Crusius M.D.; Donald P. M.D. 1947. Diabetes mellitus in infants under 1 yr of age 74(5):587-606.
- [4]. Elliot J. Rayfield M.D., Mark J. Ault M.D., Gerald T. Keusch M.D, Milton J. Brothers M.D., Charles Nechemias M.D. and Harry Smith Ph.D 1982. Infection and diabetes: The case for glucose control.
- [5]. Susan L. Norris, MD, MPH, Phyllis J. Nichols, MPH, Carl J. Caspersen, PhD, MPH, Russell E. Glasgow, PhD, Michael M. Engelgau, MD, MSc, Leonard Jack Jr, PhD, MSc, Susan R. Snyder, PhD, Vilma G. Carande-Kulis, PhD, George Isham, MD, Sanford Garfield, PhD, Peter Briss, MD, David McCulloch, MD, and the Task Force on Community Preventive Services; Increasing Diabetes Self-Management Education in Community Settings: A Systematic Review. *Am J Prev Med* 2002;22.
- [6]. Arleta Rewers, MD,PhD; H. Peter Chase, MD; Todd Mackenzie, PhD; Philip Walravens, MD; Mark Roback, MD; Marian Rewers, MD,PhD; Richard F. Hamman, MD,DrPH; Georgeanna Klingensmith, MD 2002 , 287:2511-2518.
- [7]. Barnard K, Thomas S, Royle P, Noyes K, Waugh N. 2010. Fear of hypoglycaemia in parents of young children with type 1 diabetes: a systematic review, 10:50.
- [8]. S Howard & J Allgrove 2008. Children with Type 1 diabetes should be screened for lipid abnormalities at annual review.
- [9]. Marie Marshall, Bernie Carter, Karen Rose, Ailsa Brotherton 2009. Living with type 1 diabetes: perceptions of children and their parents DOI: 10.1111/j.1365-2702.2008.02737.