

PSYCHOSOCIAL EFFECTS OF TYPE 1 DIABETES MELLITUS IN CHILDREN

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ABSTRACT

BACKGROUND

The aim of the study is to assess the psychological and general scholastic performances of the children with type 1 diabetes.

MATERIALS AND METHODS

Study design is a hospital-based cross-sectional study. 42 children of age 1-15 years were enrolled for the study. Data collected from the records and from direct interviews of parents and children. Analysis were done based on CPMS and SDQ scoring system. Statistics was done using SPSS software and Student's t-test was used for comparison.

RESULTS

Most of the children showed average school performance and reduction in school performance was noticed with advancing age. Psychological effects were experienced by all children and its severity increased with age.

CONCLUSION

Children with type 1 diabetes experience psychological stress due to the chronic nature of the illness. Financial constraints add to the stress. Severe stress was seen in older children and in girls. Regular follow up and counseling reduces the severity of stress.

KEYWORDS

Type 1 Diabetes, Psychological Effects, Scholastic Backwardness.

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BACKGROUND

Type 1 diabetes influences the lifestyle, personality and emotional well-being of the affected children as well as their parents. From the very first day of diagnosis, parents and children undergo severe mental stress, which is aggravated by the financial constraints, daily painful insulin injections, frequent blood glucose monitoring and diet restrictions.¹ Frequent alterations in blood sugar levels and emotional problems of a chronic disorder are associated with reduction in school performances.² Family members often experience the classic stages of psychological transition. Diabetes often results in profound psychological impact. Financial burden is a major factor denying adequate treatment and glucose monitoring and this produce severe mental agony in the parents and children alike.³ Quality of life of all the family members is affected by this chronic illness. Improved metabolic control gives an emotional boost to the family.⁴

Type and Setting of the Study

The study was carried out in children with diabetes mellitus attending Paediatric Endocrinology Clinic at Institute of Maternal and Child Health, Government Medical College, Kozhikode, Kerala, from January 2015 to December 2015.

Study Subjects

Children diagnosed as type 1 diabetes mellitus on regular treatment and follow up. Children <1 year and >15 years were excluded.

Methods of Study

Data collected include detailed information from the medical records and from direct interviews of parents and children. Analysis were done based on CPMS and SDQ scoring system.^{5,6,7,8}

Study Design

Hospital-based cross-sectional study.

Statistical Analysis

Statistical analysis was done using SPSS software. Data were evaluated on the basis of null hypothesis and p-value <0.05 was taken as statistically significant. Student's t-test was used for comparison.

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Observations

The study group contained 42 children with type 1 diabetes. There were 10 boys and 32 girls. Youngest child was 2 years old and the oldest 15 years old. Most of the children were >10 years (42.9%), followed by 6-12 years (38.1%). 90.5% of the children in the study group were attending school regularly. The remaining were below 5 years. This reveals that there were no school dropouts in this study and most of the children were attending classes in spite of the disease. 66.7% of the families belonged to class IV of modified Kuppuswamy scale.

14 children had disease-related complications (33.3%) requiring hospitalisations. Rest of the children did not have life-threatening complications requiring inpatient care.

In spite of various adverse factors, majority of the patients showed good compliance to the treatment (95.2%). Financial constraints were experienced by all families (100%) as they had to spend a lot for insulin treatment and for daily home monitoring of blood sugar. Home monitoring is the gold standard for the success of treatment and at least 4-5 glucose monitoring is essential for getting an optimal control. Majority of children (95.2%) were doing home monitoring of blood glucose and of these subjects, 33.3% of children were doing daily monitoring.

Home Glucose Monitoring	Frequency	Percentage
No	2	4.8
Occasional, but not daily	26	61.9
Daily glucose monitoring at home	14	33.3
Total	42	100

Table 1. Frequency of Home Glucose Monitoring by the Child/Caretaker

Most of these children (95.2%) were attending the clinics regularly and taking insulin injections. All of them were on

Age in Years	Not Studying		Poor at Studies		Average at Studies		Good at Studies		Total
	Number	%	Number	%	Number	%	Number	%	
<6	2	50	0	0	2	50	0	0	4
6-10	0	0	6	33.3	4	22.2	8	44.4	18
>10	0	0	0	0	16	80	4	20	20
Total	2	4.8	6	14.3	22	52.4	12	28.6	42

Table 4. Age and Scholastic Performances

In spite of the disease, almost all the children (90.5%) had good social interactions and they were able to cope up with their peers. Children with older age group had better social interactions. Children with disease-related complications showed less social interactions.

Social Interactions	Frequency	Percentage
No	4	9.5
Yes	38	90.5
Total	42	100

Table 5. Social Interactions

split-mix regimen and all except one child were using plain and NPH insulin via syringe and needle. Only 50% of children had refrigerator in their house. Rest of the patients were keeping the vials in their adjacent houses. All children (100%) had good family support in spite of the chronicity of illness and financial constraints.

Most of the children (95.2%) were attending the follow up clinic and education classes regularly, but some were (4.8%) infrequent visitors. Those who were visiting the clinics regularly could update their knowledge about the disease in a better way compared to infrequent visitors.

Clinic Follow Up	Frequency	Percentage
Irregular	2	4.8%
Regular	40	95.2%
Total	42	100%

Table 2. Type 1 Diabetes- Regular Clinic Follow Up

Only 28.6% of children were good at studies and most of the children (52.4%) were having average scholastic performances.

Scholastic Performance	Frequency	Percentage
Not studying	2	4.8
Bad	6	14.3
Average	22	52.4
Good	12	28.6
Total	42	100

Table 3. Scholastic Performances of Children with Type 1 Diabetes

Majority of children belonging to age group >10 years showed average school performances were as children in age group 6-10 years were good at studies. This finding showed that scholastic performances declined as age advanced.

Psychological effects were experienced by all the children in the study group. 61.9% of the children experienced psychological stress either due to the disease or its complications. The disease had dramatic results on the psychosocial effects on the child, irrespective of the age group and educational status. There is no association with compliance to treatment and psychosocial effects as all children were experiencing psychosocial problems. Financial constraints were experienced by all children and it had an impact on psychological effects.

CPMS	Frequency	Percentage
<10	16	38.1
>10	26	61.9
Total	42	100

Table 6. Classification Based on CPMS Score

Majority (80%) of children above the age of 10 years had significant psychological stress based on CPMS scoring compared to children below 5 years (50%) and 6-10 years (55.6%).

Age	<10		>10		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
<6	2	50	2	50	2	100
6-10	10	55.6	8	44.4	18	100
>10	4	20	16	80	20	100
Total	16	38.1	26	61.9	42	100
Value		df		Asymp. Sig. (2 sided)		
Chi-square	2.672	2			0.263	

Table 7. Age and CPMS

Girls had severe psychological stress compared to boys. This indicates that for a given severity of the disease, girls were having severe psychological morbidity compared to boys.

Sex	CPMS Score 10 or Less		CPMS Score More Than 10		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Boys	6	60	4	40	10	100
Girls	10	31.2	22	68.8	32	100
Total	16	38.1	26	61.9	42	100
Chi-square tests						
Value		df		Asymp. Sig.		
1.335		1		0.248		

Table 8. CPMS Score in Different Sex Groups

Children with low socioeconomic status showed significant CPMS score compared with children belonging to higher socioeconomic status. Children on regular follow up had less psychological stress compared to those without it.

Follow Up Status	CPMS Score 10 or Less		CPMS Score More than 10		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Irregular follow up	0	0	2	100	2	100
Regular follow up	16	40	24	60	40	100
Total	16	38.1	26	61.9	42	100
Chi-square tests						
Value		df		Asymp. Sig.		
0646		1		0.421		

Table 9. Follow Up Status and CPMS Score

DISCUSSION

Type 1 diabetes is a common endocrine disorder of childhood and adolescence with important consequences for physical and emotional development.⁹ We have conducted this study to evaluate the psychosocial effects on children with type 1 diabetes mellitus.

Mean age group of children with type 1 diabetes is 7-15 years according to various studies. Mean age in the present study was 10 years. There is no sex predilection for this disease, but we got a slight female preponderance.¹⁰

Various studies including a study by Northam et al proved that children with recurrent and severe hypoglycaemia had low overall intelligence.¹¹ Present study pointed out that there was no correlation between disease-related complications and scholastic performances. Present

study also concluded that more psychosocial stress was experienced by older children. This was similar to the study by Northam et al, which showed that adolescents were at increased risk for psychiatric disorder.¹¹ Study by Hanna Guthri revealed that adolescents with diabetes tend to ignore their vulnerability to the potential consequences of the disease. Present study supports this observation by showing that more psychological stress was experienced by older children.

Present study revealed that psychosocial effects were experienced by all families. This is supported by the study by Kovacs et al, which showed that many parents had psychological effects after the diagnosis of type 1 diabetes in their children.^{12,13}

Majority of children in the present study showed only average scholastic performances. This is supported by the study by Elizabeth et al, which showed that children with type 1 diabetes had mild cognitive impairment and reduced overall intellectual function. But, a study by McCarthy AM et al pointed out that type 1 diabetes will not significantly limit the functional academic abilities of children.^{14,15}

Present study showed that majority of children belonged to class IV of modified Kuppaswamy scale. This is similar to the study by Delamater AM et al, which showed that low income group was associated with increased risk for diabetes and its complications.^{2,16} In this study, children belonged to lower socioeconomic status had significant psychological stress. Study by Grey et al had similar observation, lower quality of life was associated with more chances of depression.^{17,18}

Guthrie DW et al pointed out that parents of younger children with diabetes worried more than those of older children with diabetes.¹⁹ But, the present study showed that significant psychological stress was experienced by all parents irrespective of the age of the child. Guthrie et al also pointed out that girls experienced more psychosocial stress compared to boys, which was seen the present study also.^{20,21} The present study concluded that older children experienced more psychological stress compared to younger children. This observation was seen in various other studies including one by Notham.²²

Any potentially life-threatening condition has some psychological impact and that of diabetes is often severe. Children with high life stress tend to have worse glycaemic control. Children with poor metabolic control perform poorly with stress where as those with good blood glucose levels have high levels of mental control and engage in active coping. Poor regime adherence is associated with increased psychological problems and maladaptive coping. Given the similar environment, girls are having more psychological problems. Good follow up and support groups can help parents manage the stress and cope with feelings of guilt, anxiety and fear.²³ In the present study, girls were having severe depression compared to boys. Those with poor adherence to treatment and those having infrequent follow up had more psychological problems.

SUMMARY AND CONCLUSION

Mean age group of this study was 10 years with a female preponderance. Most of the children were attending school regularly in spite of the disease and there were hardly any drop outs. Majority belonged to lower socioeconomic group. Financial constraints were experienced by all children as they had to spend for insulin and glucose monitoring strips. In spite of all these adverse environment, most of them were on regular follow up and glucose monitoring. All children had good family support in spite of the nature and chronicity of the disease. Most of the children showed average school performances and scholastic performances declined as age advanced. Psychological effects of the disease were experienced by all children and their families and majority of patients showed significant CPMS score. Severe

psychological stress was experienced by older children. There was no correlation between disease-related complications and scholastic performances, but those with complications showed less social interactions. Girls experienced more psychological effects. Children on regular follow up had less psychological stress compared to those not on follow up.

Limitations of this Study

Long-term follow up is needed for understanding the complete spectrum of psychological effects of this disease. This study is a cross-sectional observational study, hence proper understanding and follow up of psychological effects of diabetes is not possible in this study.

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CONTRIBUTION

All authors involved in case, taking and interviewing the subjects and their parents. VK was involved in data collection, analysis and writing and reviewing the manuscript.

REFERENCES

- [1] Court JM, Cameron FJ, Berg-Kelly K, et al. Diabetes in adolescence. In: ISPAD clinical practice consensus guidelines 2009:10(Suppl 12):185-184.
- [2] Delamater AM. Psychological care of children and adolescents with diabetes. In: ISPAD clinical practice consensus guidelines 2009:10(Suppl 12):175-184.
- [3] Delamater AM. Psychological issues in children and adolescents with type 1 diabetes mellitus. In: Menon R, Sperling M, eds. Pediatric diabetes. Kluwer Academic publishers, Norwell 2007:449-471.
- [4] Clinical practice guidelines 2011. Type 1 diabetes.
- [5] Goodman R. The strength and difficulties questionnaire: a research note. *J Child Psychol Psychiatry* 1997;38(5):581-586.
- [6] Goodman R. Psychometric properties of the strength and difficulties questionnaire. *J Am Acad Child Adol Psychiatry* 1999;40:133-134.
- [7] Malhotra S, Malhotra A. Psychological adjustments of physically sick children: relationship with temperament. *Indian Pediatr* 1990;27(6):577-584.
- [8] Malhotra S, Varma VK, Verma SK, et al. Childhood psychology measurement schedule: development and standardization. *Indian J Psychiatr* 1988;30(4):325-331.
- [9] Guthrie DW, Barsocas B. Psychological issues for children and adolescents with diabetes: overview and recommendations. *Diabetes spectrum* 2003;16(1):7-12.
- [10] Homes CS, Respass D, Greer T, et al. Behavioral problems in children with diabetes. *J Pediatr Psych* 1998;23(3):179-185.

- [11] Northam EA, Anderson PJ, Jacobs R, et al. Neuropsychological profiles of children with type 1 diabetes, 6 years after disease onset. *Diabetes care* 2001;24(9):1541-1546.
- [12] Glastras SJ, Mohsin F, Donaghue KC. Complications of diabetes mellitus in childhood. *Pediatr Clin N Am* 2005;52(6):1735-1753.
- [13] Kovacs M, Finkelstein R, Feinberg TL, et al. Initial psychological responses of patients to the diagnosis of insulin dependent diabetes mellitus in their children. *Diabetes Care* 1985;8:568-575.
- [14] McCarthy AM, Lindgren S, Mengeling MA, et al. Effects of diabetes on learning in children. *Pediatrics* 2002;109(1):e9.
- [15] Charron-Prochownik D, Kovacs M, Obrosky DS, et al. Biomedical and psychosocial predictors of early rehospitalization among children with insulin-dependent diabetes mellitus: a longitudinal study. *Diab Med* 1994;11(4):372-377.
- [16] Lessing DN, Swift PG, Metcalfe MA, et al. Newly diagnosed diabetes: a study of parental satisfaction. *Arch Dis Child* 1992;67(8):1101-1013.
- [17] Laffel LM, Vangsness L, Connell AI. Impact of ambulatory, family-focused teamwork intervention on glycemic control in youth with type 1 diabetes. *J Pediatr* 2003;142(4):409-416.
- [18] Grey M, Boland EA, Yu C, et al. Personal and family factors associated with quality of life in adolescents with diabetes. *Diabetic Care* 1998;21(6):909-914.
- [19] Nguyen TM, Mason KJ, Sanders CG, et al. Targeting blood glucose management at school improves glycemic control in children with poorly controlled type 1 diabetes. *J Pediatr* 2008;153(4):575-578.
- [20] Davis EA, Soong SA, Byrne GC, et al. Acute hyperglycemia impairs cognitive function in children with IDDM. *J Pediatr Endocrinol Metab* 1996;9(4):455-461.
- [21] Rovert J, Alvarez M. Attentional functioning in children and adolescents with IDDM. *Diabetes Care* 1997;20(5):803-810.
- [22] Northam EA, Matthews LK, Anderson PJ, et al. Psychiatric morbidity and health outcome in type 1 diabetes--perspectives from a prospective longitudinal study. *Diabetes Medicine* 2004;22(2):152-157.
- [23] Vijayakumar M. Psychological aspects. Chapter 13. In: Irani AJ, Menon PSN, Bhatia V, eds. *Type 1 diabetes mellitus in children and adolescents in India. Clinical Practice Guidelines 2011*. 1st edn. Lucknow: ISPAE 2011:88-95.