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EMOTIONAL WELL-BEING IN TYPE 1 DIABETIC ADOLESCENTS AND ITS IMPACT ON GLYCAEMIC CONTROL AND ORAL HYGIENE STATUS.

Dental Science

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ABSTRACT

Background: Poor emotional well-being among type 1 diabetes mellitus subjects may disrupt glycaemic control and neglect oral hygiene.
Aim: To determine association between poor glycaemic control and Oral Hygiene status with emotional well-being in T1DM adolescents.
Methods and Material: A cross sectional study was conducted among 107 Type 1 diabetic adolescents. Emotional Wellbeing domains were assessed using WHO-5 Well-Being Index; Oral hygiene status was recorded using Oral Hygiene Index Simplified and Glycaemic control was determined using haemoglobin A1c test.
Results: A significant association was noted with poor emotional well-being and elevated level of HbA1c and poor oral hygiene status.
Conclusion: Children with recent diagnosis of type 1 diabetes mellitus, older age of onset, elevated HbA1c were identified to have higher prevalence of current poor emotional wellbeing. These children should be prioritized for behavioural and cognitive counselling.

KEYWORDS

glycaemic control, wellbeing, oral hygiene status, type 1 diabetes

Introduction

Type 1 diabetes, resulting from beta-cell destruction and absolute insulin deficiency, caused due to environmental risk factors during the neonatal period and in infancy, plays a significant role in setting off the autoimmune process.[2] Type 1 Diabetes mellitus is known to have a considerable impact on vulnerable minds of adolescent subjects and their parents. Furthermore poor quality of life and well-being may seriously disrupt glycaemic control and lead to neglect of oral hygiene.[2,3] Previous Studies have shown that oral health is considerably poor in diabetic subjects.[4]

Although type 1 diabetes mellitus (T1DM) has an impact on emotional wellbeing and quality of life of adolescents, its association with oral hygiene and glycaemic control is yet not clear in Indian scenario. Hence this study was undertaken. Children and young people with diabetes are at a greater risk for depression and behavioural problem due to tender age and lack of experience.[5,6] The aim of the study was to determine association between poor glycaemic control and Oral Hygiene status with emotional wellbeing.

MATERIAL AND METHODS

A cross sectional analytical study was conducted among 107 Type 1 diabetic adolescent aged 13 to 17 years visiting a Hospital. The wellbeing domains were assessed using WHO-5 Well-Being Index.[6] Oral hygiene status was recorded using Oral Hygiene Index Simplified given by John C. Green and Jack R. Vermillion in 1964.[7] The association of wellbeing with age of onset, level of HbA1c and oral hygiene status was determined using ANOVA and Chi square statistical tests.

The study was approved by the Institutional ethical committee. Parents gave written informed consent and adolescents gave assent. Sample size determination was performed using single proportion formula and was estimated to be 98. Inclusion criteria were Type 1 diabetes mellitus adolescents aged 13 to 17 year with the onset of diabetes at least six months prior to the commencement of the study and absence of any other systemic disease other than diabetes. The Study duration was 3 months. 107 Type 1 Diabetic adolescents satisfying the inclusion and exclusion criteria and willing to give informed consent were included in the study. Demographic details of the patient, Age of onset, duration of Diabetic condition and level of HbA1c were recorded for the patient. The wellbeing domains were assessed using WHO-5 Well-Being Index it is a short self-reported measure of current mental wellbeing[8,9] (Table 1). Oral hygiene status was recorded using Oral Hygiene Index Simplified given by John C Green and Jack R Vermillion in1964. The association of wellbeing with age, gender, duration of diabetes, level of HbA1c and oral hygiene status was determined using ANOVA, F test and Pearson's correlation coefficient statistical tests.

Table 1: WHO-5 Well-Being Index illustrating the score given for each response

Sr.no	Questions	A	B	C	D	E	F
1.	I have felt cheerful and in good spirits.	5	4	3	2	1	0
2.	I have felt calm and relaxed.	5	4	3	2	1	0
3.	I have felt active and vigorous.	5	4	3	2	1	0
4.	I woke up feeling fresh and rested.	5	4	3	2	1	0
5.	My daily life has been filled with things that interest me.	5	4	3	2	1	0

a: all of the time b: most of the time c:more than half of the time d: less than half of the time e: some of the time f: never

Depression was defined by a WHO-5 wellbeing score ≤13.

Results:

The participants consisted of 56 (52.3%) girls and 51 (47.7%) boys. The average HGA1c level was (9.35%); 7% or lower was considered as the target for good metabolic control in diabetics.[10] Mean age of subjects was 15.7 years. Amongst the subdomains, poor well-being (E and F responses) was reported to be 56% for feeling cheerful and in good spirits, 78.23% for feeling calm and relaxed, 65.5% for feeling active and vigorous, 70.2% to wake up fresh and rested and 51.% for feeling that daily life is filled with things of interest.

WHO-5 well-being index indicated presence of low mood (<52%) in 64.6% of the subjects. Poor emotional well-being was significantly greater in female gender (71.2%) as compared to male gender (58.3%).

Early onset of T1DM (<6 years of age) was associated with significantly lower adverse impact on wellbeing of a diabetic subject, suggestive of fewer behavioural problems (Table 2). Poor emotional wellbeing was significantly ($p<0.01$) associated with poor glycaemic control (above 7% of HbA1c) and poor oral hygiene status (1.5±0.7) (Table 3) (Table 4).

Table 2: Association of Age of onset and Glycosylated Hb level of the patient with WHO-5 Well-being index scores.

	WHO – 5 Score (Mean (%))
Age at onset of T1DM	
<6 years	18.6 (74.4)
>6 years	10.7 (42.8)
P value	<0.01
HbA1c	
Elevated (above 7%)	11.5(46.4)
Not elevated	15.4(61.6)
P value	<0.01

Table 3: Comparison between degree of Diabetic control (as measured by glycosylated haemoglobin concentration) and the presence of depression as measured by the WHO-5 wellbeing index (n=107)

		Mean glycosylated Haemoglobin	
WHO – 5 score	**N**	**Good control (5 – 9%)**	**Poor control(9% or more)**
Poor wellbeing (≤13)	70	19	51
Good wellbeing (>13)	37	28	9

Chi square = 8.0 ($p < 0.01$)

Table 4: Associations of Oral hygiene status with emotional wellbeing (WHO-5 score)

WHO-5 score	Oral hygiene index (score) mean±SD	P value
≤13	1.5±0.7	<0.01
>13	08±0.5	

Discussion

There was a significant association between poor mental well-being with poor glycaemic control and Oral hygiene status. Contradictory to the current findings in the study P Fonagy et al conducted a study which concludes that patients with good glycaemic control reported more psychiatric disturbances.[11] This can be explained due to the fact that anxiety among the diabetic adolescents may lead to strict compliance of diet plans and disciplined lifestyle. Ann Gath et al conducted a study which suggested that poor diabetic control correlated with the presence of adverse psychosocial factors.[12] Ladea M et al conducted a study which suggested that depression associated with DM type 1 is more severe which lead to poor glycaemic control.[13,14] Depressive symptoms and emotional dysregulation, is an indicator of poor coping/ behavioural control.[10,11] The chronicity of the illness has been attributed to negative symptoms, which are potentially devastating to oral health as they impair a patient's desire to maintain a good oral hygiene.[15]

Counselling sessions should be conducted in Type 1 diabetic adolescent subjects in order to maintain good mental health. Oral health education programs can be organized for Type 1 DM patients to interact with patients and educate them about good oral hygiene practices. However the study has certain limitations, long term periodic monitoring of such patients should be done, secondary factors such as the mental depression among parents, the family, and all the possible school and social factors that may influence the relationship between quality of life and well-being of the patient must be carefully taken into account. It is recommended to administer the Major Depression (ICD-10) Inventory for the individuals with a raw score of below 13 or if the patient has answered 0 to 1 to any of the five items in WHO 5 wellbeing index.[16]

Conclusion:

Children with recent diagnosis older age at onset, elevated HbA1c were identified to have higher prevalence of various psychological and emotional problems and exhibited poor emotional wellbeing. In resource-limited settings, these children should be prioritized for psychological and emotional evaluation followed by standardised counselling sessions. If supported by future research, interventions to promote beneficial finding may prove useful for adolescents coping with this challenging illness. There is a need for more longitudinal studies.

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