Characterization of adolescents with diabetes-related emotional distress

Dr. Byron Fabricio Saa Sabando
Professor of Medicine at the Universidad Regional Autónoma de los Andes (UNIANDES Santo Domingo).
Email: us.byronsaa@uniandes.edu.ec, https://orcid.org/0000-0001-8719-4562

Dr. Valeria Monserrath Zúñiga Sánchez
Professor of Medicine at the Universidad Regional Autónoma de los Andes (UNIANDES Ambato).
Email: ua.valeriazuniga@uniandes.edu.ec, https://orcid.org/0000-0002-6765-0660

Dr. Alberto Sánchez Garrido
Professor of Medicine at the Universidad Regional Autónoma de los Andes (UNIANDES Ambato).
Email: ua.albertosanchez@uniandes.edu.ec, https://orcid.org/0000-0002-2418-7020

Abstract

Introduction: Despite significant medical advances in treating type 1 diabetes (T1D) in young people, it exposes them to complications such as disease-related distress.

Objective: To characterize the DRD trajectories of adolescents by starting point and rate of change over time.

Methods: The sample included 264 adolescents with TD1 who participated in the study. The study was conducted in primary care.

Results: Participants had a mean age of 15.7 ± 1.1 years at the start of the study. 70.1 % administered insulin using an infusion pump instead of injections.

Conclusions: In this study, we identified clinically significant subgroups of adolescents with type 1 DM.

Palabras clave: diabetes mellitus, primary care, adolescents, treatment source: DeCS

Resumen

Introducción: A pesar de los avances médicos significativos en el tratamiento de la diabetes tipo 1(T1D) en jóvenes, los expone a complicaciones como el distrés relacionado con la enfermedad.

Objetivo: Caracterizar las trayectorias de DRD de los adolescentes según el punto de partida y la tasa de cambio a lo largo del tiempo

Método: La muestra incluyó a 264 adolescentes con DT1 que participaron en el estudio. El estudio se realizó en atención primaria.

Resultados: Los participantes tenían una edad media de 15,7 ± 1,1 años al comienzo del estudio. El 70,1 % administraron insulina usando una bomba de infusión en lugar de inyecciones.

Conclusiones: En este estudio, identificamos subgrupos clínicamente significativos de adolescentes con DM tipo 1.

Palabras clave: diabetes mellitus, atención primaria, adolescentes, tratamiento

fuente: DeCS

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Introduction

Despite significant medical advances in the treatment of type 1 diabetes (T1D), less than a quarter of adolescents achieve clinically recommended levels of glycemic control, putting many young people at risk for future kidney damage, cardiovascular disease and other serious complications(1).

Change in diabetes-related distress (DRD) over time has been evaluated in a few studies. Longitudinal analysis is needed to examine the stability, rate of change, and factors that predict the severity or improvement of DRD, guiding potential intervention strategies.(2)

In a study evaluating adults with type 2 diabetes, researchers found small subgroups indicating possible clinical concern; these included 2.4% with severe persistent DRD and 6.5% with moderate but increasing DRD(3). In an analysis of a related construct (diabetes-specific acute stress) among 59 adolescents with newly diagnosed TD1, researchers found little change over 1 year(3–12).

In this secondary analysis of the intervention trial data, there were 2 objectives:

(1) Characterize adolescent DRD trajectories by baseline and rate of change over time, (2) focus on youth with elevated and persistent patterns of DRD, to identify baseline predictors of these chronic DRD.

Method

An intervention study was conducted where the sample included 264 adolescents with DT1 who participated in the study. The study was conducted in 2 primary care practices in the city of Santo Domingo and recruited participants through mailings, diabetes clinic brochures, and websites that offer young people the opportunity to learn diabetes management strategies. This study was approved by the Universidad Regional Autónoma de Los Andes (UNIANDES).

Included youths were required to be aged 14 to 18 years, at least 1 year after diagnosis of diabetes, and prescribed at least 0.5 U per 1 kg of insulin daily. Exclusion criteria were current antidepressant medication and previous diagnosis of major depression, a developmental disorder, other major mental disorders, or other chronic illnesses, not including thyroid or celiac disease.

Youth were randomly assigned to 1 of 2 interventions delivered in 9 group sessions every 2 weeks. The resilience intervention taught the development of cognitive behavioral skills to manage general and diabetes-related stressors, while participants in the educational intervention received advanced training.

During evaluation visits, participants completed surveys in private using an electronic survey. Participant retention at the end of 16 months was high; 92.4% of youth(n=244) were actively participating, 16 (6.1%) were lost to follow-up, and 4 (1.5%) formally withdrew.

The study assessed age, sex, race, caregiver-reported mother's education (college graduate or not), caregiver-reported family income, and family composition.

Blood glucose controls were estimated per day from the 14-day history recorded by the participants' glucometers and downloaded at baseline. In addition, self-care behaviors were rated by the young people on the Self-Care Inventory, a 15-item questionnaire.

Participants rated the amount they argued with family members about diabetes self-management tasks using the 20-item Diabetes Family Conflict Scale. Response options ranged from 1 ("almost never argue") to 3("almost always argue") youth assessed their coping skills using the 8-item Coping Effectiveness Questionnaire.

Responses were made on a 4-point scale from 1 (e.g., "not at all well") to 4 (e.g., "very well"). We used the total score on the 25-item Social Problem Solving Inventory to capture the problem-solving style and ability, revised short format. Higher scores signified more adaptive problem-solving ability. Database and statistical processing of the data were performed and analyzed in SPSS 26 statistical software (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used for the results collection, presentation and interpretation.

Results

Participants had a mean age of 15.7 ± 1.1 years at the start of the study (Table 1). More girls than boys were enrolled (59.8% vs. 40.2%). One-third of the youth were non-white, and 16.7% of the duration was 6.9 years. Most participants (70.1 %) administered insulin using an infusion pump rather than injections.

The average Hb A1 c 9.1 was comparable to other adolescent samples but higher than the clinical guideline of 7.5% for pediatrics.

Table 1: Baseline characteristics of the participants (N=264)

Features	Education - Intervention (N=131)	Resilience - Intervention (N=133)	All participants (N=264)
Age in years	15,7	15,7	15,7
Females % Female	60,3	59,4	59,8
Mother's education	57,3	65,4	
Family composition (more than 2 caregivers) % (more than 2 caregivers)	84	73,7	78,8
Duration of diabetes in years standard deviation	6,5 (3,9)	7,3 (4,2)	6,9 (4,0)
Insulin regimen			
Infections	32,1	27,9	29,9
Insulin pump	67,9	72,2	70,1
HBA1c % HBA1c % HBA1c % HBA1c % HBA1c % HBA1c	9,1	9,1	9,1
Blood glucose monitoring	3,5	3,9	3,7
Self-care behaviors	54,7	53,4	54,1
Depressive symptoms	7,9	7,6	7,7
Anxious symptoms	37,9	37,2	37,6
Diabetes-related family conflict	27,6	27,7	27,7
Coping effectiveness	24,8	24,6	24,7
Troubleshooting	12,8		12,9

Source : statistical analysis , p≤ 0.05 .

Discussion

This study of adolescent DRD classified two-thirds of the sample as "better" over time; these youth tended to start with low to medium levels of DRD. One-third of the youth were classified as having significant chronic DRD; on average, they reported moderate to high levels of DRD at baseline, their DRD did not significantly improve over time, and they were more likely to start the study with a glycemic index above target control, less frequent self-care, elevated psychological levels, distress and more maladaptive. A small subset of these youth, almost all girls, had shown particularly depressive and anxiety symptoms, high diabetes-related family conflict, and poor problem-solving. Despite this group's small size, the scores on these variables were significantly worse than those of another group of trajectories with elevated DRD suggesting a clinical significance between youth with high and moderate levels[20,21].

This study provides a clinically informative typology of adolescents with type 1 DM. Female sex, baseline Hb A1 c and depressive symptoms. The vulnerability of girls with type 1 DM is consistent with differences in the prevalence of emotional difficulties in adolescence. The majority of girls in the current study were classified as having a lower DRD demonstrating that elevated DRD is not expected evidence for young people of both sexes; however, there may be a benefit considering sex in interventions designed especially for distressed youth with DM[3,4].

The positive associations between chronic illness and elevated Hb A1 c and depressive symptoms are consistent with evidence finding an overlap between these three problem areas[6,7]. It denotes that youth with a history of major depression were excluded from the present study, designed exclusively to test a depression prevention intervention[3–19] . Despite this exclusion, 35% of youth in this study experienced persistent and problematic levels of DRD, underscoring the importance of targeted screening and treatment for DRD.

It is possible that some of the improvement in DRD in the current study was driven by youth participation in the interventions, particularly the resiliency intervention, which in a previous analysis was associated with a greater reduction in DRD than the educational intervention[10]. However, DRD often persists without intervention and may worsen over time, based on studies in adults.

The resilience intervention tested in other studies contains components that have been shown to help address DRD, including cognitive-behavioral skills[15–19]. Targeted clinical screening for DRD with existing validated measures can efficiently identify adolescents needing intervention. [7–11]

Limitations of the study should be considered. The results do not indicate how DRD might develop over time outside the context of an intervention. Future investigation of DRD in a larger sample without intervention over a longer time would help clarify the nature of DRD trajectories, including the degree of longitudinal change or fluctuation.

Conclusions

The study identifies clinically significant subgroups of adolescents with type 1 DM. The study does not describe clinical profiles of importance for diabetes research and intervention but also provides an example of how to consider clinical demographic and psychosocial variables related to specific chronic diseases.

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