Poster number P2-260

Adherence to Diabetes Care in Children and Adolescents with Type 1 Diabetes Mellitus in Spain: Results from the CHRYSTAL Study*

Juan Pedro López-Siguero,[1] Luis Alberto Vázquez,[2] Renata Villoro,[3] Dingfeng Jiang,[4] Maria Merino,[3] Jesus Reviriego,[2] Magaly Perez-Nieves[4]

[1]Hospital Universitario Carlos Haya, Málaga, Spain; [2]Eli Lilly and Company, Madrid, Spain; [3]Instituto Max Weber, Madrid, Spain ; [4]Eli Lilly and Company, Indianapolis, IN, USA

BACKGROUND

CHRYSTAL (**C**osts and **H**ealth **R**elated **Q**uality **y** of Life **S**tudy for **T**ype **I** **D**iabetes **M**ellitus in **P**aediatric **P**atients in **S**pain) is an observational study conducted in 2014 on a sample of 275 patients aged 0-17 years with Type 1 Diabetes Mellitus (T1DM), distributed across 12 randomly selected sites that treat diabetic children and adolescents in Spain. The sites were distributed across 8 geographical regions grouping Autonomous Communities (Figure 1).

Figure 1. Sites Distribution

1. H. U. 12 de Octubre, Madrid, 2. H. U. Fundación Alcorcón, Madrid, 3. H. U. Vall d Hebron, Barcelona, 4. H U. Sant Joan, Reus, 5. H. U. de Cruces, Barakaldo, 6. H. U. i Politècnic la Fe, Valencia, 7. H. General Nuestra Señora del Prado, Talavera de la Reina, 8. H. U. Virgen del Rocío, Sevilla, 9. H. Comarcal de la Axarquía, Vélez-Málaga, 10. H. Clínico U. San Cecilio, Granada, 11. C. H. U. Insular Materno Infantil, Las Palmas de Gran Canaria, 12. H. U. A Coruña, A Coruña.

The distribution of the sites and the sample size are representative of the T1DM paediatric population as it is being treated in the country.

The CHRYSTAL study estimated healthcare resource utilization and costs of diabetic children and adolescent, the quality of life of patients and their primary caregivers and the adherence of patients to diabetes care.

One of the objectives of the study was to describe the adherence to diabetes care using the Self-Care Inventory Revised questionnaire (SCI-R), and to compare results by HbA1c level for paediatric patients with T1DM in Spain.[1,2]

The SCI-R is a brief, psychometrically sound measure of perceptions of adherence to recommended diabetes self-care behaviours of children and adolescents with type 1 or type 2 diabetes.

This poster shows the results obtained from the exploratory endpoint of adherence to diabetes care using the SCI-R in the CHRYSTAL study.

METHODS

Patients 11 years old and over were asked to directly respond to the SCI-R in a single visit. Primary caregivers acted as proxy respondents for children under 11. The SCI-R consists on a 15-item self-report scale (each ranged from 1 to 5, 5 being the highest possible adherence level) to assess patients' perceptions of their adherence to diabetes self-care recommendations.

Items were classified in the following 5 domains.[3]

- **Diet**, which includes: Eat recommended food portions, Eat meals/snacks on time, Keep food records, and Read food labels.
- **Glucose monitoring**, which includes: Check blood glucose with monitor, and Record blood glucose results.
- **Medication administration**, which includes: Take correct dose of diabetes pills/insulin, Take diabetes pills/insulin at the right time, and Adjust insulin.
- **Exercise**, which includes: Exercise regularly.
- **Low glucose level**, which includes: Treat low blood glucose, and Carry quick acting sugar for lows.
- **Preventive / Routine**, which includes: Check ketones, Attend clinic appointments, and Wear medic alert.

*Any differences with the results shown in the abstract available in the congress books are due to using a more appropriate SCI-R domain classification for the calculation of the results shown in this poster.

Adherence scores (mean and standard deviation) for each domain and overall SCI-R score (the average of the domain scores) were calculated[2]. Differences of overall SCI-R score and its domain scores were analysed by HbA1c level, comparing patients with adequate glycemic control (HbA1c <7.5%, n=161) vs. those with inadequate control (HbA1c ≥7.5%, n=114), using the Mann-Whitney U test.

RESULTS

Table 1 describes sample characteristics.

Table 1. Patient Characteristics (n=275)

Age (mean, SD)	10.96 (3.89)
Gender (% male)	52.4%
Years from diagnosis (mean, SD)	4.98 (3.24)
Puberty status (% post pubertal)	57.3%
HbA1c level (mean, SD)	7.42 (0.96)

SD = Standard Deviation.

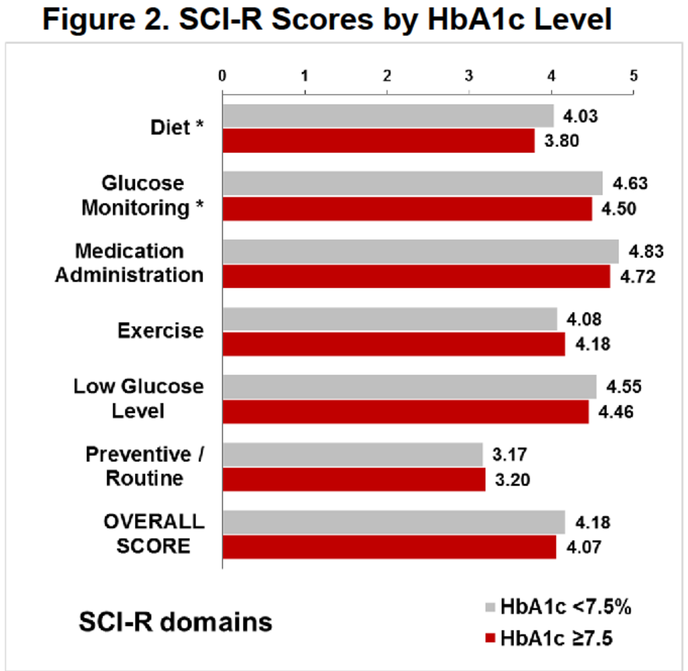
Adherence scores by domain are shown in Table 2.

Table 2. Adherence Behavior Scores by Domain

	Mean	Standard Deviation
Diet	3.94	0.74
Glucose monitoring	4.58	0.70
Medication administration	4.78	0.36
Exercise	4.12	0.92
Low glucose level	4.51	0.65
Preventive / Routine	3.18	0.79
Overall score	**4.13**	**0.41**

Figure 2 shows results by HbA1c level.

Figure 2. SCI-R Scores by HbA1c Level

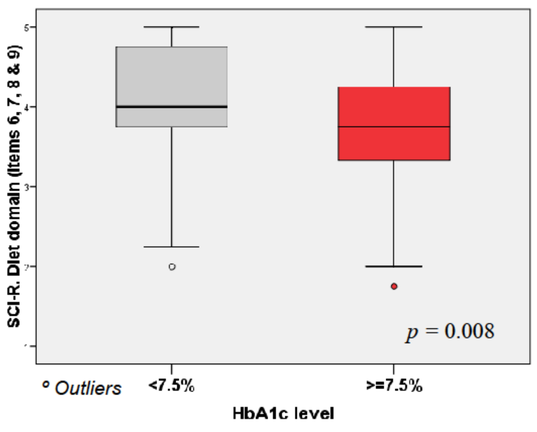


SCI-R = Self-Care Inventory-Revised.
** Statistically significant differences by HbA1c (p<.05)*

Diet and Glucose Monitoring were the only domains with statistically significant differences in medians by HbA1c (p=.008 and p=.049 respectively).

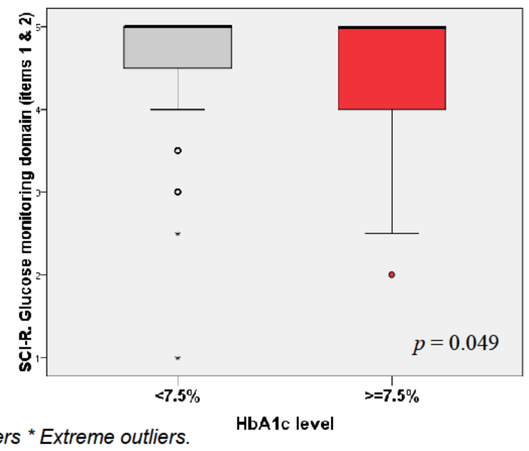
Children with HbA1c <7.5% reported better adherence to Diet than children with HbA1c ≥7.5% (Figure 3).

Figure 3. Diet by HbA1c Level



Children with HbA1c <7.5% reported better adherence to Glucose monitoring than children with HbA1c ≥7.5% (Figure 4).

Figure 4. Glucose Monitoring by HbA1c Level



*° Outliers * Extreme outliers.*

DISCUSSION

Perception of adherence to diabetes care is an important factor to consider while managing diabetes. This is the first representative study at the national level to assess adherence in T1DM paediatric population in Spain.

Previous research has shown that youth with better self-care levels in all dimensions have significantly better glycemic control.[4-6] In our study significant differences in scores by HbA1c level were found only in the Diet and Glucose Monitoring dimensions. While the latter has one of the highest adherence scores, the Diet dimension, along with the Preventive/Routine dimension, had the lowest adherence score in the sample.

LIMITATIONS

There are three main limitations to our study. First, as with all studies based on self report, our results lack a "gold standard" comparison and can only be interpreted in a subjective manner. Second, the SCI-R includes only one item for exercise, which might unbalance the overall scale. Third, the sample size was calculated to power T1DM cost estimation when the study was designed, and it might not power the SCI-R adherence endpoint.

CONCLUSIONS

- Our results provide the first insight on T1DM self-care behaviour and related problems in the paediatric population in Spain.
- The highest reported adherence relates to Medication Administration, Glucose Monitoring and Low Glucose level.
- The lowest adherence scores are related to Diet and Preventive behavior.
- Higher adherence to Diet and Glucose Monitoring activities is associated with better HbA1c levels.
- Our results highlight the importance of improving healthcare programs that target better prevention and diet control in T1DM children in Spain.

Acknowledgements:

The authors are thankful to the patients and the caregivers who provided their time to answer the SCI-R. We also thank all principal and collaborator investigators involved in patient recruitment and data collection of the CHRYSTAL study.

References:

1. The SCI-R is available at: https://www.psy.miami.edu/media/college-of-arts-and-sciences/psychology/documents/faculty/alagreca/SCI-R.pdf
2. La Greca AM, Manual for the Self Care Inventory, University of Miami, Sept. 2004.
3. Weinger K, Butler HA, Welch GW, La Greca AM, Measuring Diabetes Self-Care, A psychometric analysis of the Self-Care Inventory-revised with adults, Diabetes Care 2005;28:1346-1352.
4. Harris MA, Greco P, Wysocki T, Elder-Danda C, White NH. Adolescents with diabetes from single parent, blended and intact families: health-related and family functioning. Fam Syst Health 1999;17:181–196.
5. Wysocki T, Taylor A, Hough BS, Linscheid TR, Yeates KO, Naglieri JA. Deviation from developmentally appropriate self-care autonomy: association with diabetes outcomes. Diabetes Care 1996;19:119–125.
6. La Greca AM, Swales T, Klemp S, Madigan S, Skyler J. Adolescents with diabetes: gender differences in psychosocial functioning and glycemic control. Child Health Care 1995;24:61–78.

European Society for Paediatric Endocrinology (ESPE); Barcelona, Spain; 1-3 October, 2015

Sponsored by Eli Lilly and Company and/or one of its subsidiaries

ESPE 2015 260--P2

Diabetes and Insulin

Juan Pedro López-Siguero

DOI: 10.3252/pso.eu.54espe.2015

Poster presented at: 54th Annual Meeting 1-3 October ESPE 2015 BARCELONA European Society for Paediatric Endocrinology

PosterSessionOnline.com