366 / Abstract ID 53

PERSISTENT USE OF A CONTINUOUS GLUCOSE MONITORING SYSTEM OVER 12 MONTHS

GLUCOSE SENSORS

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Background and Aims: The benefits of continuous glucose monitoring (CGM) require ongoing use. Past studies suggest that use ≥6 days/week is optimal to obtain benefit. We examined usage of Dexcom's G6 CGM system over the course of 12 months.

Methods: We studied anonymized data from a convenience sample of 3,000 US-based patients who first uploaded a G6 estimated glucose value (EGV) before 01-SEP-2018 and whose most recent uploaded EGV was within 1 week of the 1-year anniversary of their start date. Persistence was the percentage of observed days in which ≥1 EGV was uploaded. For each patient-week, the number of days with ≥1 EGV was calculated. Data density was the ratio of observed to possible EGVs.

Results: At 1 year, most patients had used the system on >96% of possible days and 90% of observed patient-weeks had CGM usage on ≥6 days. Overall data density was >83%. Usage statistics were high in all self-reported age groups, but lower among teens/young adults than among those <13 or >25 years of age (Table).

Conclusions: The high persistence, proportion of patient-weeks with ≥6 days of use, and data density suggest that G6 users trust, find value in, and benefit from their CGM.

Age (years)	<13	13-25	>25	Overall
n	500	700	1800	3000
Mean (SD) 1-year persistence	92.04 (15.61)%	87.14 (17.50)%	90.93 (14.17)%	90.22 (15.37)%
Median (IQR) 1-year persistence	98.36 (92.60-100.0)%	94.25 (82.74-98.63)%	96.71 (89.32-99.18)%	96.44 (88.49-99.18)%
Patient-weeks with ≥6 days CGM usage	90.00%	84.86%	92.00%	90.00%
Data Density	83.34%	79.71%	84.63%	83.27%

368 / Abstract ID 312

EFFICACY OF INSULIN DEGLUDEC IN ADOLESCENTS WITH TYPE 1 DIABETES DURING RAMADAN FASTING: AN OBSERVATIONAL STUDY WITH FREESTYLE LIBRE FLASH GLUCOSE MONITORING SYSTEM

GLUCOSE SENSORS

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Background and Aims: Insulin degludec (IDeg) is an ultra-long-acting insulin, with flat time-action profile, having a lower risk of hypoglycemia. The study assessed frequency, timing and severity of hypoglycemia of insulin IDeg as basal insulin in T1DM adolescence who are willing to fast.

Methods: Thirty eight patients (19 males) with T1DM (mean age 15.8 ± 3.4 years) and duration of diabetes (5.2 ± 1.7 years) were included. Patients had their IDeg doses titrated using pre-Iftar (sunset-meal) and pre-Suhur (sunrise-meal) glucose values. Participants were able to adjust their bolus doses according insulin to carbohydrates ratios. IDeg was reduced initially by 15% of pre-Ramadan dose and administered at time of Iftar. Patients were monitored using the FreeStyle Libre® flash glucose monitoring (FGM)system.

Results: Mean BG was 176 ± 49 mg/dl and overall time spent in hypoglycemia was $5.7\% \pm 3.0\%$ of total monitoring period. Rate of hypoglycemia according to time intervals was 0%,3%, 8%, 15%and 64% in (19:00–24:00), (24:00–04:00), (04:00–10:00), (10:00–14:00) and (14:00–19:00) respectively. Out of all hypoglycemic flashes for patients, 74% were between60 and 69 mg/dl, 23% between 50 and 59 mg/dl, and 5% below 50mg/dl. There was no significant change ($p = 0.211$) in glycemic control measured by fructosamine level between pre-Ramadan (221.7 ± 63.8 mg/dL) and end-of-Ramadan (234.8 ± 71.7 mg/dL).Basal insulin was reduced by $35 \pm 18\%$.

Conclusions: Hypoglycemia was encountered in the last few hours of fasting preceding Iftar time necessitating dose reduction to minimize the severity and duration of hypoglycemia. This helps adolescents with T1DM observe Ramadan in a healthy and fulfilling manner under close supervision.

369 / Abstract ID 460

DOES TIME IN RANGE PREDICT HBA1C?

GLUCOSE SENSORS

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Background and Aims: HbA1c is a parameter of glycemic control and predictor of long-term diabetic complications and plays a fundamental role in type 1 diabetes (T1D) management, nevertheless it has limitations. Continuous glucose monitoring (CGM) is a novel strategy that evaluates glycemic daily profiles and glycemic variability using the time-in-range (%TIR), glucose between 70–180 mg/d, as a new parameter. The aim of this study was to evaluate the association of %TIR with HbA1c in subjects with T1D.

Methods: Subjects of the Type 1 Diabetes National Registry in Mexico (RENACED DT1) using CGM and with complete %TIR values in the previous 2 weeks were included. The variability of HbA1c explained by the %TIR was assessed with linear regression analysis (R2). Polynomial regression was used to fit %TIR values to HbA1c.

Results: We included 49 subjects, 32 (65.3%) female with median HbA1c 7.5% (6.8–8.1). Characteristics of the population are presented in table 1. We found a negative correlation between

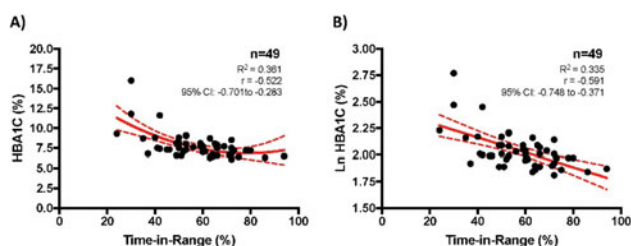| Parameter	N=49
Female sex (n;%)	32 (65.3%)
Age (years)	31.06 (12.93)
T1D duration (years)	16.2 (10.3)
HbA1C (%)	7.5 (6.8-8.1)
BMI (kg/m2)	22.7 (3.5)
Weight (kg)	60.6 (12.8)
Total insulin dose (IU)	37.6 (16.4)
Frequency of SMBG/day (n)	3 (2-5)

Figure 1: Non-linnear (A) and linnear fit (B) of time-in-range with HBA1C Type 1 Diabetes National Registry in Mexico (RENACED DT1).

%TIR and HbA1c (r = -0.522, 95% CI: −0.701, −0.283; p < 0.001), that increased after logarithmized HbA1c (r = -0.591, 95% CI: −0.748, −0.371; p < 0.001). In linear regression analysis, %TIR explained 33.35% of the variability of HbA1c and 36.13% using a non-linear fit. There was a negative association between %TIR (B = -6.509) and HbA1c that persisted with logarithmized HbA1c (B = -0.007, p < 0.001) (Figure 1).

Conclusions: We found a strong correlation between %TIR and HbA1c and a non-linear relation between both parameters. These findings suggest that %TIR is a good parameter for assessing glycemic control.

370 / Abstract ID 527

IS THE DIFFERENCE REALLY ONLY IN CONTINUOUS GLUCOSE MONITORING?

GLUCOSE SENSORS

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Background and Aims: Insulin pump therapy (CSII) modestly reduces HbA1c compared with multiple daily insulin injections (MDI). Recent evidence suggests that continuous glucose monitoring (CGM), regardless of insulin delivery method, results in HbA1c reductions. The objective is to examine glycemic control via HbA1c in four treatment strategies: CGM+MDI, CGM+CSII, self-monitoring of blood-glucose (SMBG) +MDI and SMBG+CSII in patients of the T1D National Registry in Mexico (RENACED-DT1).

Methods: We included subjects using insulin analogues. Glycemic goal was defined as HbA1c ≤7.0%. Kruskall-Wallis and Dunn-test were used to assess differences in HbA1c between groups. A logistic-regression model evaluated the probability of achieving glycemic goal adjusting for sex, age and time since diagnosis.

Results: 603 subjects were included (SMBG+MDI: 474; SMBG+CSII: 18; CGM+MDI: 64; CGM+CSII: 47). Biochemical and anthropometric characteristics are presented in Table 1. The SMBG+CSII (7.35 [6.8–8.2], p < 0.01), CGM+MDI (7.75 [7.0–8.5], p < 0.001) and CGM+CSII (7.8 [6.8–8.4], p < 0.001) showed lower HbA1c compared to SMBG+MDI (8.8 [7.4–10.5]) (Figure 1). There were no differences in HbA1c between CGM+MDI and CGM+CSII groups. The CGM+CSII group had increased probability (OR: 2.27, 95%CI: 1.12, 4.39, p = 0.02) of achieving glycemic control compared with SMBG+MDI after adjustment for covariates (Table 2).

Conclusions: The use of CGM+MDI or CSII with or without CGM compared with MDI+SMBG is associated with lower HbA1c. Further research is needed to assess long-term effectiveness, impact of each component in glycemic control and in complications.

Table 1: Group characteristics of Type 1 Diabetes National Registry in Mexico (RENACED-DT1). Abbreviations: SMBG= self-monitoring of blood glucose, MDI= multiple daily insulin injections, CGM= continuous glucose monitoring, CSII= continuous subcutaneous insulin infusion.

Parameter	SMBG + MDI (474)	SMBG + CSII (18)	CGM + MDI (64)	CGM + CSII (47)	p value
Female sex (n;%)	296 (62.4%)	10 (55.6%)	43 (67.2%)	29 (61.7%)	0.807
Age (years)	25.3 (±12.3)	29.3 (10)	32.8 (17.6)	27.3 (13.1)	<0.001
T1D duration (years)	12.8 (±9.5)	19.1 (9.8)	15.9 (12.5)	14.6 (10)	0.007
HbA1c (%)	8.8 (7.4-10.5)	7.35 (6.8-8.2)	7.75 (7.0-8.5)	7.8 (6.8-8.4)	<0.001
HbA1c ≤7.0% (n;%)	75 (15.8%)	6 (33.3%)	13 (20.3%)	14 (29.8%)	0.028
BMI (kg/m2)	23.1 (±4.4)	23.8 (±3.2)	22.4 (±3.7)	23.5 (±4.4)	0.500
Weight (kg)	60.1 (±17.3)	63.6 (±11.1)	59.0 (±16.7)	62.1 (±17.8)	0.668
Total insulin dose (IU)	46.95 (±23.1)	27.58 (±16.11)	34.8 (±14.3)	38.6 (±21.9)	<0.001
Frequency of SMBG/day (n)	3 (2-4)	5 (3-6)	3 (3-7)	3 (2-5)	<0.001

adaptation of the patient management plan. IT literacy of staff, training times, and costs limit the use of technological advances. Microsoft Excel - a cheap, simple, and easily accessible program - empowers teams to create dynamic spreadsheets. We aimed to increase the time efficiency of the Paediatric Diabetes team by improving their spreadsheet.

Methods: The original HbA1c spreadsheet was assessed using a questionnaire and team discussion. The spreadsheet was amended based on team requirements and suggestions. Data grouping was used to simplify the spreadsheet. Conditional formatting highlighted missing data and appointments, upcoming appointments, and colour coded HbA1c values within certain ranges. Summaries were evaluated using "COUNTIF" and "AVERAGE" formulae. Four hours were spent by a medical student implementing these changes.

Results: All participants reported the new spreadsheet was easier to use. Post-implementation questionnaire responses noted that the spreadsheet had higher accuracy and improved layout. The time taken for data input by healthcare professionals reduced by 77.7% (from 45 to 10 minutes per month).

Conclusions: Better data presentation enables healthcare professionals to provide further support to those with higher HbA1c therefore improving patient care. This could be adapted to various teams, especially those managing chronic conditions. Clinicians could consider investing time in straightforward programs like these, as they can be effective at a lower cost than new technological advances.

441 / Abstract ID 531

CURRENT CHARACTERISTICS OF PATIENTS WITH LATENT AUTOIMMUNE DIABETES IN ADULTS IN MEXICO: A MULTICENTRIC STUDY

INFORMATICS IN THE SERVICE OF MEDICINE; TELEMEDICINE, SOFTWARE AND OTHER TECHNOLOGIES

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Background and Aims: Information regarding Latent Autoimmune Diabetes in Adults (LADA) in Mexico is lacking.
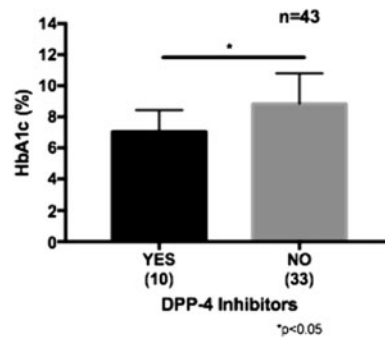

Figure 1: Differences in HbA1c in DPP4 inhibitor users vs non users

RENACED-DT1 is a longitudinal national registry for patients with type 1 diabetes (T1D) and LADA in Mexico.

Methods: Currently 1,586 patients have been registered; of those, 48 patients were diagnosed with LADA. We present a descriptive analysis of this group.

Results: 58.3% are women, 65.2% over 30 years of age at diagnosis; 30.4% have had diabetes for <5 years, 37%, between 6 and 10 years, 15.2% between 11–15 years and 17.4%> 16 years. Mean HbA1c and BMI at diagnosis were 8.42% and 23.7 kg/m2, respectively. GAD65-Ab, evaluated in 15 cases, were positive in 86.6%. At diagnosis 64% were treated with oral agents, 23% with insulin and 12.8% with both. Currently 89.5% are on insulin treatment, 16.7% with insulin pump, 56.3% with multiple daily injections, 8.3% on basal insulin and 4.2% on a co-formulation; 50% have additional treatment with metformin, 23% with DPP-4 inhibitors, 19% with sulfonylureas and 6.3% with SLGT2-inhibitors. Subjects treated with DPP-4-inhibitors have lower HbA1c (7.1% [5.8–7.8] vs 8.5%, [5.8–7.8], respectively $p < 0.01$) (Figure 1). Three patients have retinopathy and 3 neuropathy. No nephropathy was found. Dyslipidemia occurs in 30.6% and hypertension in 16.7%.

Conclusions: A high prevalence of LADA cases are misdiagnosed. In order to improve diagnosis and understand the presentation of this condition the registration and follow-up of more cases is needed. Recognizing this condition is important to start optimal treatment (DPP-4-inhibitors in C-peptide positive patients, insulin in C-peptide negative patients) and delay chronic complications.

442 / Abstract ID 395

EFFICACY OF THE DIABEO SYSTEM FOR THE PRAGMATIC TELEMEDICINE MANAGEMENT OF DIABETIC PATIENTS POORLY CONTROLLED WITH A BASAL-BOLUS INSULIN REGIMEN

INFORMATICS IN THE SERVICE OF MEDICINE; TELEMEDICINE, SOFTWARE AND OTHER TECHNOLOGIES

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