A one year follow up study to evaluate efficacy and compliance of continuous glucose monitoring (CGM) in children and young people with T1DM

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Authors declare no conflict of interest

Introduction

Self monitoring of blood glucose (SMBG) is an important part of diabetes management[1]. Continuous glucose monitoring system (CGM) provide the real time measurements of users' glucose levels. The advantage of CGM is the availability of information about blood glucose levels at all times which helps to adjust the insulin doses. The NICE guidelines for management of Type 1 diabetes recommend that "Children and young people with type 1 diabetes who have persistent problems with hypoglycaemia unawareness or repeated hypoglycaemia or hyperglycaemia should be offered continuous glucose monitoring systems."[2] In UK there is limited funding for the use of CGM due to lack of evidence for the benefits of CGM use over SMBG in improving control. In our clinic in a large DGH, we have a cohort of 12 children and young people (CYP) who were funded for the CGM use for at least one year.

Aim

To assess the effects of CGM on metabolic control, hypoglycaemic episodes and overall compliance over a period of 12 months in CYP with T1DM.

Methods

Data from a cohort of 12 patients who were commenced on Dexcom CGM was collected retrospectively. All the patients were on continuous subcutaneous insulin infusion (CSII) via insulin pump. Main reason for CGM use was parental fear of hypoglycaemia and frequent reported hypoglycaemic events. We compared HbA1c and frequency of hypoglycaemic episodes over 12 months. We also report their compliance and side effects related to CGMS use.

Results

12 patients (8 males), with median age 14.5 years (5-18 years) used CGM over a year. There were issues with non compliance. Up to 5 patients used the CGMS sensor intermittently after 8 months continuous usage. 2 patients reported problems with allergy to plaster and CGM device not sticking very well.

There was significant improvement in the HbA1c within 1 month of usage and that sustained over 9months. No difference in HbA1c was found at 12 months

Table 1. Comparing HbA1c prior to CGM use and over the year

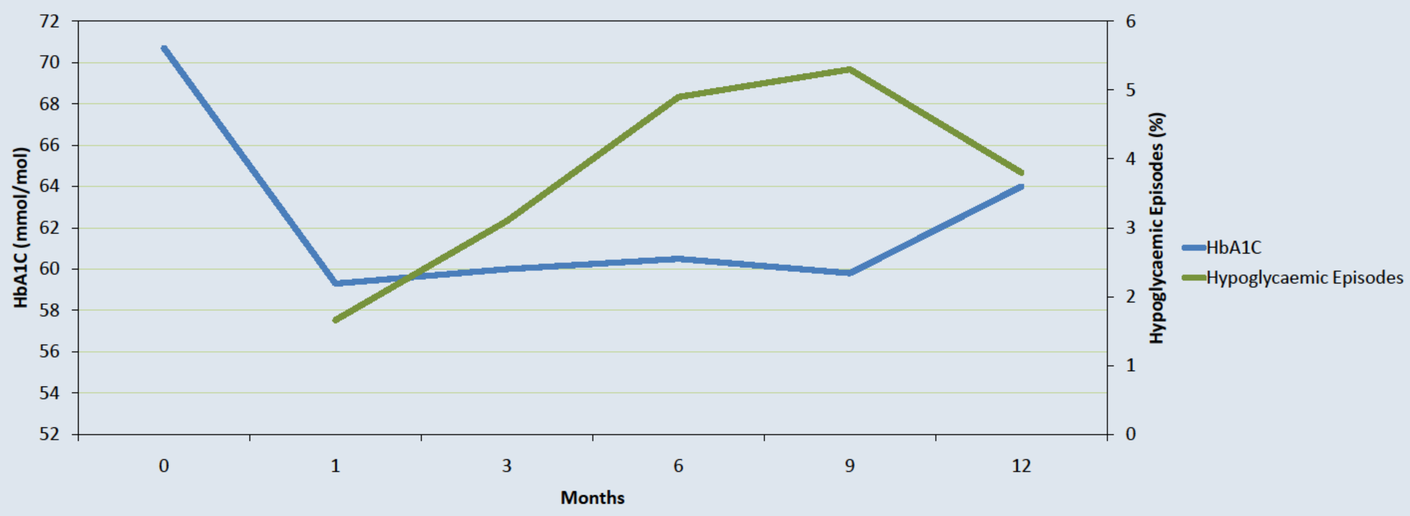
	Mean (SD) DCCT %	Mean (SD) mmol/mol	95% Confidence Interval	p- Value
Pre- CGM HbA1c	8.6 (1.2)	70.7 (13.4)		
1 months	7.5(0.9)	59.3 (10.9)	3.6 -19.1	.008
3 months	7.6 (1.2)	60.0 (12.9)	2.8-18.6	.012
6 months	7.7 (1.0)	60.5 (11.0)	-0.56 – 21.1	.061
9 months	7.6 (0.4)	59.8 (4.2)	1.92 – 20.0	.022
12 months	8.0 (0.9)	64 (9.6)	-2.9-16.4	0.15

Average number of hypoglycaemic episodes were 1.66% during the first month of CGM usage. Number of hypoglycaemic episodes increased significantly at 6 months of usage but at 12 months there was no significant difference. None of the patients had severe hypoglycaemia needing third party assistance.

Table 2. Comparison of hypoglycaemic episodes (%)

Hypoglycaemic Episodes (%)	Mean (SD)	95% Confidence Interval	P-Value
1 month	1.66 (1.3)		
3 months	3.1 (3.1)	- 2.96- 0.02	0.052
6 months	4.9 (3.7)	-5.26- -1.12	0.006
9 months	5.3 (3.3)	-6.85-0.28	0.065
12 months	3.8 (2.7)	-5.11- 1.56	0.239

Graph showing Hba1C trend and Hypoglycaemic episodes over a year. No significant relation was found between them.



Conclusion

In clinical practice use of CGMS showed improvement in control within a short period of time but it was not sustained over 12 months. Hypoglycaemic episodes were infrequent during the 12 months of CGMS use. Number of hypoglycaemic episodes increased significantly between 3-6 months of use which coincided with improvement in HbA1c. Compliance of long term use of CGMS was low at 58% even in a healthcare that funds its use.

References

1. Haller MJ, Stalvey MS, Silverstein JH. Predictors of control of diabetes: monitoring may be the key. The Journal of pediatrics 2004;144:660-1.
2. NG18. Diabetes (type 1 and type 2) in children and young people: diagnosis and management. In: NICE, ed.2015.

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