Short-term use of continuous glucose monitoring system in pediatric patients with type 1 diabetes mellitus and correlation with short-term improvement in glycemic control

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Introduction

Type 1 diabetes mellitus (T1DM) is an autoimmune disease that can be diagnosed at very young ages. Tight glucose control has been associated with decreased microvascular and macrovascular disease. However, it is a challenge for both practitioners and parents to achieve good glycemic controls without complications such as hypoglycemia. The relatively recent use of continuous glucose monitoring systems (CGMS) allows both practitioners and patients to monitor their daily glucose ranges more closely than the alternative use of random glucose checks. Many studies on the effectiveness of CGMS have been conducted. Long-term (2-6 months) CGMS use has been shown to improve hemoglobin A1c (HgA1c) in both adults and children[1-4]. However, long-term CGMS has proven less effective in children than their adult counterparts. Some of the reasons stated in the current literature included the fact that children are less likely to wear CGMS for extended periods of time. Also discussed was the fact that children will not adjust insulin delivery based on CGMS data on a daily basis[3&5]. In this study, we will study the effects of short-term (2-5 days) CGMS on HgA1c in T1DM pediatric patients..

Objectives

Several studies have shown that there may be a relationship between the use of CGMS and improved glycemic control in patients with T1DM. Most of these studies have focuses on long term CGMS. The purpose of this study is to determine if there is a significant correlation between the clinical (office based) use of short-term CGMS and improvement in glycemic control in pediatric patients with T1DM.

Methods

A retrospective chart review was conducted of 28 T1DM pediatric patients that were non-randomly chosen to use the short-term CGMS in a pediatric diabetes clinic. There were 17 males and 11 females. They were ages 5-18 years old. The reasons a CGMS was recommend included: hyperglycemia (7), hypoglycemia (4), glucose fluctuations (8), sports-related (4), to improve control (4), insurance request (1).The variables investigated in this study were: HgA1c before and after the use of the CGMS, age and gender. A paired T test was used to analyze the data.

Demographics

Gender	Number in Study
Female	11 (39%)
Male	17 (61%)

AGE	Years Old
Minimum	5
Maximum	18
Mean	10.9

Results

Variable	HgA1C (%)
Pre-HgA1C	9.16 ± 0.4
Post-HgA1C	8.70 ± 0.3
p-Value	0.10

Discussion

The average HgA1c pre-CGMS was 9.16%, and in the follow up visit (average time between visits was 94.5 days) was 8.70%. While the HgA1c post-CGMS visit was lower than the pre-CGMS the difference was not statistically significant with a p-value of 0.10.

Conclusion

While HgA1c was lower after short-term CGMS in pediatric patients with T1DM, the difference was not statistically significant. This study did lack power and it is possible that if we increased the number of patients the results may show significance.

References

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