

Acceptability issues of Continuous Glucose Monitoring among Diabetes Patients attending Clinic in North Bihar

Dr. Amit Kumar Das*

Diabetologist, Shree Hospital & Maternity, Muzaffarpur, Bihar, India

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*Corresponding author: Dr. A.K. Das

Abstract

Original Research Article

Aim: Continuous Glucose Monitoring (CGM) provides significant benefits for diabetes management. To introduce this modern technique to patient population understanding patient's perceptions of CGM benefits and potential annoyances is important. The main objective of the study is to assess the acceptability issues of CGM among diabetes patients attending clinic in north Bihar. **Methods:** A total of 40 diabetic adults went through a 7-day observational study. After the monitoring period, they completed a survey regarding acceptability of CGM sensors. **Results:** More than 90% of the study participants agreed that the CGM sensor and receiver were easy to use (37/40), useful (38/40), and provided relevant information that was of interest to them (36/40). Furthermore, 85% (34) felt more safe (15% neutral) while sleeping and 78% (31) more confident (22% neutral) about avoiding serious hypoglycemia. 84% would choose to be inserted again. **Conclusion:** Introduction of CGM in elderly patients with well-controlled diabetes resulted in high satisfaction without imposing additional diabetes distress. Furthermore, an added benefit in glucose control with stabilizing glycemia in target range was proven.

Keywords: Continuous Glucose Monitoring, Diabetes, physiological monitoring, North Bihar.

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INTRODUCTION

Continuous Glucose Monitoring (CGM) provides significant benefits for diabetes management. To introduce this modern technique to patient population understanding patient's perceptions of CGM benefits and potential annoyances is important. In diabetes self-management CGM has been shown to enhance psychosocial outcomes such as increased confidence and to be clinically effective [1]. It has been observed that some users not realizing such benefits mainly because of interindividual variability [2]. It also has been observed that the benefits of CGM implant depends on duration of usage and as the duration shorter the benefits will also become limited [3].

Related to the use of CGMs for disease management, an increasing number of studies have begun to use CGMs in research to examine the acute effect of dietary intake and physical activity on insulin concentrations and glucose metabolism in both diabetic [4-7] and nondiabetic populations [8-12]. Despite the growing utilization of CGMs in diet and physical activity research beyond the diabetic population, and its potential as a tool to promote diet and physical activity behaviour change, questions have remained about the acceptability of CGMs to Diabetic individuals.

The main objective of the study is to assess the acceptability issues of CGM among diabetes patients attending clinic in north Bihar.

METHOD

This is an observational study which has conducted at diabetes care private clinic set up at Muzaffarpur situated at Northern part of Bihar. A total of 40 diabetic adults went through a 7-day observational study. All patients who were enrolled in this trial has signed a patient's informed consent form and visited the clinic with an attender especially with a family member who also became an eye witness for the entire procedure.

After the monitoring period, they completed a survey regarding acceptability of CGM sensors. Responses are rated on a 5-point scale from "much better" to "much worse." It has minutely taken care that all participants understand the questioner and answered them without any influence.

Quantitative analysis was conducted using SPSS v.21, and free-text responses were analysed using content and thematic methodology.

RESULTS

Average age of the participants was 54±6 years and 24 were male. Mean HbA1c was 7.8±0.5, with 6±2 years as mean duration of diabetes.

Table 1 describes the mean response regarding 5-point scale survey regarding acceptability of CGM sensors.

Table-1: 5-point scale survey regarding acceptability of CGM sensors.

Item	Mean response (SD)
Do you now feel more confident or less confident that you can control your diabetes?	2.78 ± 0.60
Has your A1C improved or has it worsened?	2.09 ± 0.85
Have your blood glucoses become more or become less of a “roller coaster”?	2.38 ± 0.67
Do you now feel more motivated or less motivated to keep up with your diabetes management?	2.12 ± 0.97
Is it now harder or is it easier to adjust your insulin doses correctly?	2.52 ± 0.77
Do you now feel more safe or less safe when exercising?	2.48 ± 0.77
Do you now feel more safe or less safe about sleeping?	2.13 ± 0.80
Do you now feel more fearful or less fearful about hypoglycemia?	2.17 ± 0.98
Do you now feel more confident or less confident that you can avoid serious hypoglycemia?	2.78 ± 0.59
Are your friends and family now bothering you less or bothering you more about your diabetes?	2.72 ± 0.61

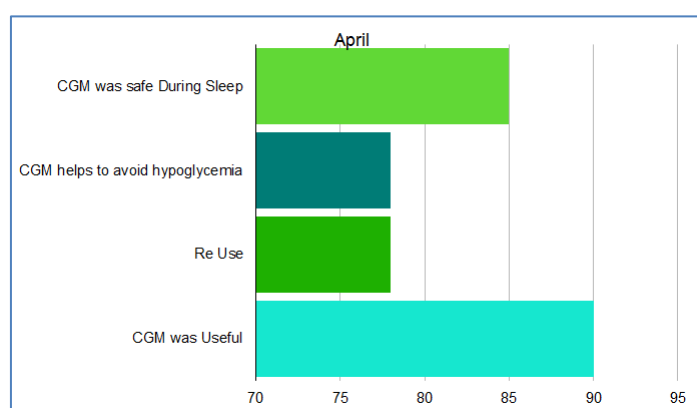


Fig-1: Percentage (%) of patient's opinion levels in survey.

More than 90% of the study participants agreed that the CGM sensor and receiver were easy to use (37/40), useful (38/40), and provided relevant information that was of interest to them (36/40). Furthermore, 85% (34) felt more safe (15% neutral) while sleeping and 78% (31) more confident (22% neutral) about avoiding serious hypoglycaemia. 84% would choose to be inserted again. (Figure 1)

DISCUSSION

Results from this study suggest high acceptability of using a CGM in a diabetic adult especially from north Bihar locality. These data suggest that participants were using the two devices as instructed during the monitoring period. After wearing the CGM sensor and using the CGM receiver for 1 week, more than 90% of the study participants agreed that the CGM sensor and receiver were easy to use,

useful, and provided relevant information that was of interest to them. These results demonstrate a great potential for using CGM in diabetic adults as previous research has suggested that individuals will not engage with technology that is challenging to use or is perceived as irrelevant to their needs [13, 14].

Results from this study suggest that although diabetic individuals do not mind wearing a minimally invasive CGM device for 1 week, the motivation for wearing it was moderate, possibly due to the lack of ability to interpret or make sense of all the data that were available to them. As the barriers to tracking and collecting health behavior data are overcome by technological advancements, the challenge ahead will be determining how to most efficiently and effectively use these data to provide meaningful insights and useful feedback to users. Thus, more behavioral research that uses CGMs and other biological sensors is needed to

offer evidence-based recommendations that assist individuals with their behavior change goals.

In a state like Bihar where most of the diabetic patients were coming from remote places and understanding the patients along with literacy is a biggest concern for implementation of any modern diagnostic technology, this observational study once again confirm that proper counselling and through explanation with better understanding definitely increase the success rate. This study also reveals that after thorough understanding of the implant procedure and regular follow up patients satisfaction rate was quite high and even they were ready to be inserted again. This outcome of this trial will encourage the physicians of entire Bihar to use CGM frequently and let the diabetes management more beneficial.

CONCLUSION

Introduction of CGM in elderly patients with well-controlled diabetes resulted in high satisfaction without imposing additional diabetes distress. Furthermore, an added benefit in glucose control with stabilizing glycemia in target range was proven.

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