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# A Study to Assess the Knowledge regarding Continuous Glucose Monitoring use among Physician of Bihar

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**Abstract**
**Aim:** *The main objective of this observational study to assess the knowledge regarding continuous glucose monitoring (CGM) use among Physics of Bihar*
**Method:** *This was an observational survey conducted among physicians who carried a diabetic clinic and mostly treating both from of diabetes that is Type 1 Diabetes and Type 2 Diabetes in their clinical practice. A pre structured questionary was prepared to conduct the survey among 61 physicians across the Bihar state. Collected data was analysed by using statistical methods.*
**Result:** *14% clinicians were well aware of CGM where as 66% were having poor knowledge and 20% were having no idea of the same. Among patients with type 2 diabetes The usage was higher for patients with type 1 diabetes (T2DM; 38/61, 62.3% vs 23/61, 37.7%; P<.001) by these physicians. The analysis also reveals that education, family income, diabetes type, age, duration of Diabetes and location were associated with CGM machine usage in adult patients (P<.05). The greatest difficulties to the physicians to use of CGM machine to manage diabetes patients include limited time (7/61, 11.4%), complicated operations (31/61, 50.8%), patients' distrust (12/61, 19.7%), and cost (11/61, 18.1%).*
**Conclusion:** *The awareness and use of continuous glucose monitoring (CGM) in patients with diabetes and the proportion of physicians using CGM to manage their diabetes patients are low.*
**Keywords:** *Diabetes mellitus, CGM, surveys and questionnaires.*

## Introduction

Monitoring of blood glucose is the most crucial to diagnose and treat different type of diabetes patients in today's context. Diabetes Control and Complications Trial (DCCT) already confirmed that diabetes mellitus often does not achieve the target glycated hemoglobin level despite of intensive treatment[1]. In India specially in Bihar, physician's general depends on self-monitoring blood glucose reports (SMBG) to measure glucose levels after meals or overnight among their diabetic patients. In several study already established the fact that SMBG helps to detect asymptomatic nocturnal hypoglycemia and postprandial hyperglycemia several times daily[2-4].

To avoid manual error of SMBG, CGM machine was developed and introduced into the market. A continuous glucose monitoring system (CGM) is a compact medical system that continuously monitors your blood sugar levels in more or less real time (there's normally a five-minute interval between readings)[5]. To use a CGM, patient has to insert a small sensor onto his abdomen that

includes a tiny cannula that penetrates the skin. An adhesive patch holds the sensor in place, allowing it to take glucose readings in interstitial fluid (the fluid that surrounds cells in the body) throughout the day and night. Generally, the sensors have to be replaced every 10 to 14 days. A small, reusable transmitter connected to the sensor allows the system to send real-time readings wirelessly to a monitor device that displays your blood glucose data. Some systems come with a dedicated monitor, and some now display the information via a smartphone app, so patient don't even need to carry an extra device around with him.

There were several studies which has confirmed the advantages of continuous glucose monitoring system (CGM) over conventional self-monitoring of blood glucose (SMBG)[6-9]. When any clinicians' analyses and use CGM results, it promptly untoward glycemic excursions and minimizing both hypoglycemia and hyperglycemia.

The exact knowledge of CGM usage was not evaluated earlier and it can be necessary data and can help to create the awareness towards providing advance diabetes care by the concern physician to his patients. The main objective of this observational study to assess the knowledge regarding continuous glucose monitoring (CGM) use among Physics of Bihar

**Methods**

This was an observational survey conducted among physicians who carried a diabetic clinic and mostly treating both from of diabetes that is Type 1 Diabetes and Type 2 Diabetes in their clinical practice. A pre structured questionary was prepared to conduct the survey among 61 physicians across the Bihar state.

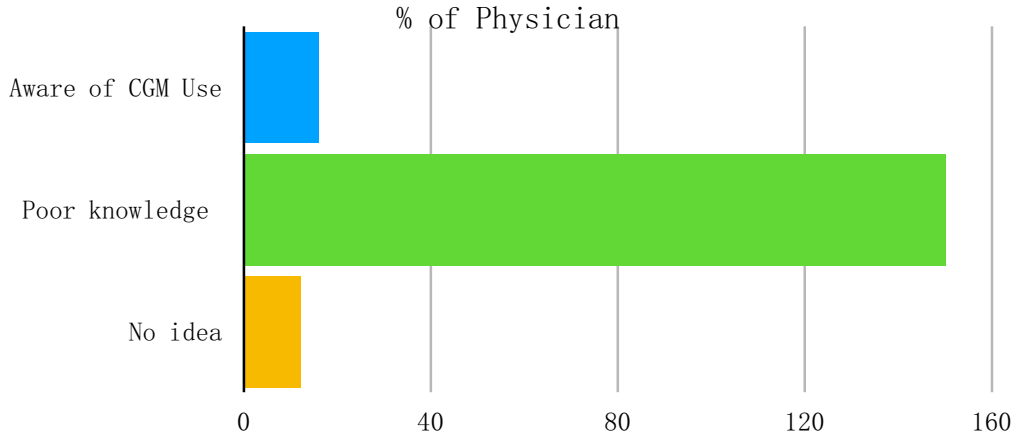
By convenient purposive sampling technique, data collection was done. To all participants investigator had explained the purpose of the study and consent was taken from each participant.

Collected data was analysed by using statistical methods through using SPSS version 23.0 (IBM Corp). In terms of objectives of the study, data were tabulated and analysed using descriptive and inferential statistics. Questionnaires with missing values were excluded from the multivariate analysis. Statistical significance was indicated with $P<.05$.

**Result**

There were total 61 physicians were taken part for this observational survey among them 36 physicians who were trained in Diabetes management and 14 are general practitioner who also treat diabetes extensively.

**Table 1:** Percentage of Clinicians knowledge regarding use of CGM device



16% clinicians were well aware of CGM where as 72% were having poor knowledge and 12% were having no idea of the same for patients with type 2 diabetes (Table 1).

The usage was higher for patients with type 1 diabetes (T2DM; 38/61, 62.3% vs 23/61, 37.7%; P<.001) by these physicians.

The analysis also reveals that education, family income, diabetes type, age, duration of Diabetes and location were associated with CGM machine usage in adult patients (*P*<.05).

The greatest difficulties to the physicians to use of CGM machine to manage diabetes patients include limited time (7/61, 11.4%), complicated operations (31/61, 50.8%), patients' distrust (12/61, 19.7%), and cost (11/61, 18.1%).

**Discussion**

World one of the most unmet medical challenge is to prevent and control diabetes. by lifestyle modifications and physical activity that incorporate weight loss as well as intense medication can control diabetes but for the great majority of individuals long term adherence is still a challenge[10,11]. Thus, developing advanced blood glucose monitoring options for diabetes patients has gain a lot of interest and research.

Present study was initiated mainly because to address a major gap in proper diagnosis of diabetes. Despite CGM is considered as most authentic tool to understand the glycemic level and its pattern, across the globe including advanced city of the country, still there is a concern among majority of clinicians specially in a state like Bihar. In recent past there was still no survey conducted to estimate the awareness level regarding CGM usage in eastern part of India.

Awareness was the major concern for the use of CGM machine. This study reveals that mainly because of less knowledge physicians we're reluctant to advice their patients to implant this tiny CGM machine. As per the study, 16% clinicians were well aware of CGM where as 72% were having poor knowledge and 12% were having no idea of the same for patients with type 2 diabetes.

As per this study, the greatest difficulties to the physicians to use of CGM machine to manage diabetes patients include limited time (7/61, 11.4%), complicated operations (31/61, 50.8%), patients' distrust (12/61, 19.7%), and cost (11/61, 18.1%). This result revels that in certain indices of hypoglycemia and maintenance of target HbA1c levels, CGM use was associated with significant improvements. Like this study Peyrot et al[12] has also confirmed that the main hindrance of CGM use was understanding of cost benefit ratio. Like other studies, it remains in the question that how benefits of CGM usage and its incorporation into diabetes management on psychosocial and patient-reported outcomes is still exist[13,14].

The main reasons given by Physicians as affecting patient blood glucose management with CGM were limited time, complicated operations, patients' distrust and cost. More doctors in tertiary hospitals than in primary hospitals thought that the largest obstacle to using CGM to manage patients with diabetes was limited time, and more younger doctors and doctors from primary hospitals believed that patients' distrust was the largest obstacle. Therefore, improving the specialty of young doctors and doctors from primary hospitals can effectively improve patients' trust in these doctors, reduce the burden on senior doctors from tertiary hospitals, and effectively promote using CGM machine to manage patients.

The analysis also reveals that education, family income, diabetes type, age, duration of Diabetes and location were associated with CGM machine usage in adult patients (*P*<.05). This is a clear indication that the usage of this is restricted to a very little group of patients.

**Conclusion**

The awareness and use of continuous glucose monitoring (CGM) in patients with diabetes and the proportion of physicians using CGM to manage their diabetes patients are low. There is a need of increase awareness among physicians

regarding the benefits of CGM use towards better glycemic management of their patients. Ddifficultés only can overcome with proper patient counselling and demonstration of cost vs benefit ratio.

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