UTILITY OF THE FIRST GENERATION ARTIFICIAL PANCREAS AND THE FACTORS INFLUENCING THE FREQUENCY OF SENSOR USE: AN INDIAN REAL-WORLD DATA

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BACKGROUND AND AIMS

The latest integrated sensor augmented pump therapy system MiniMed640G, is one step closer to Artificial Pancreas (AP) and can automatically suspend insulin delivery when sensor glucose levels are predicted to approach hypoglycemic range and resumes insulin delivery once sensor glucose levels recover. The study assessed the utility of this first generation AP among our patients and the factors / concerns influencing the frequency of sensor use.

MATERIALS AND METHODS

A brief survey was conducted among our T1DM (n=12) and T2DM patients (n=10) and our clinicians (n=4) to access the utility of the first generation AP system.

ADVANTAGES RECOUNTED BY THE PATIENTS	% PATIENT RESPONSES
Enhances the confidence in managing diabetes with minimal fear of hypoglycemia	95.45%
The glucose meter wirelessly links to the pump's Bolus Wizard (TM) calculator, eliminates manual entry error, allows convenient and discreet remote bolusing, and automatically calibrates the sensor	90.90%
Better glycaemic picture provided by the personal software enabling improved diabetes management	86.36%
Features like the colour screen, easier navigation around menus than the previously available pumps	81.82%

Table 1. Advantages of the AP System as recounted by the patients

CONCLUSION

The AP system assessed has tremendous clinical utility both among T1DM and T2DM individuals when used as recommended. In those deserving patients where continuous use of sensor is a lifesaving procedure, there should be measures for periodic retraining, enhancing the confidence, ensuring uninterrupted supply of sensors and influencing policy makers for reimbursement measures for the less affordable.

RESULTS

Patients recounted many positive experiences with the use of AP and appreciated many of its features.

68.17% of the patients (92% T1DM and 40% T2DM) used the sensors continuously.

FACTORS / CONCERNS INFLUENCING THE FREQUENCY OF SENSOR USE	FEASIBLE RECOMMENDATIONS IDENTIFIED
Many users were initially uncomfortable to learn the techniques of sensor use	With frequent feedbacks from our diabetes care team, patients became more motivated and were willing to use it continuously
Patients with a history of severe hypoglycemia	Patients started using the sensors more frequently to avoid hypoglycemia. They were dependent on sensors to the extend that a temporary period off the sensor made them anxious
Fear and discomfort with sensor needle insertion	Patients were advised to adopt proper insertion techniques like using a 'pinchable' area for insertion, to use a local anesthetic cream or a cool pack to the numb tissue just prior to sensor placement
Alert or alarm fatigue	Setting the alert ranges at appropriate values. e.g. better not to set any alerts at all or to set only low glucose alerts in the initial few weeks to allow the users to get comfortably accustomed to using the device
Cost concerns	To take initiatives to make the government and policymakers aware of the utility of the device so that appropriate reimbursement policies are implemented for the deserving patients.

Table 2. Factors influencing the frequency of sensor use as recounted by the less-frequent users

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