Potential of OneTouch Diabetes Management Software System in Real Field for Korean Type 2 Diabetes Patients

Boram Kang, Jae Hyoung Cho
Department of Endocrinology and Metabolism, College of Medicine, The Catholic University of Korea, Seoul, Korea

For more effective glucose control, the patients should be able to see their glucose data in more detail. Especially, they have to modify their lifestyle including diet according to the variable postprandial glucose patterns as well as fasting glucose levels. Therefore the ability to measure and record glucose levels by themselves when needed in daily life is a very important part of appropriate diabetes management [1-5]. In general, physicians assess patients’ glucose control status over the past few months based on glycosylated hemoglobin (HbA1c) level measured in the clinic or hospital, and the patients consult their physicians and receive education and prescriptions according to laboratory results including HbA1c. However, it is not easy for physicians to find and correct some aggravating factors for the increased HbA1c because the patients cannot remember all factors associated with such changes. A glucose diary recorded in a log book would make it possible to assess the changes in fasting and postmeal glucose levels and follow-up on glucose variation according to time [6]. With such the change patterns, it would be possible to track and predict the changes in glucose level.

Unfortunately, it is very difficult for patients to measure and assess their glucose levels and modify their lifestyle or medication according to the results by themselves [7,8]. Tracking glucose variation and predicting their glucose change would be difficult to apply in real life [7]. It would cause an argument about a real clinical efficacy of checking self-monitored blood glucose (SMBG), and so interpreting the glucose change pattern and applying it to real practice would be more important rather than measuring glucose level itself [14-16]. In other words, the measured glucose data needs to be shown to both patients and doctors more effectively.

OneTouch Diabetes Management Software (OTDMS) was designed to track and monitor blood sugar levels. OneTouch Ultra™ makes it possible to download data from a point-of-care testing device via the meter’s data port, which connects the glucometer and computer, and transform recorded blood sugar level into a graph, a chart, or statistics. It shows all data
regarding blood glucose level with marks of "low," "under control," and "high." It also shows daily variation of blood glucose level with a line graph and proportion of "low," "under control," and "high" blood glucose level with a pie chart, as well as the distribution of blood glucose level and the proportion of "low," "under control," and "high" blood glucose level according to time variation. With this software, physicians can observe patients' glucose change pattern very easily and quickly at a glance and a more effective consultation can be expected in real practice.

In this regard, the study by Kim et al. [17] was planned to evaluate whether the use of OTDMS would improve patients' (1) knowledge of diabetes mellitus, (2) compliance, (3) satisfaction with doctor and medical treatment, (4) doctor-patient reliability, and (5) glucose control in real clinical consultation. Using the markers measured by OTDM, the authors assessed the clinical effectiveness of the software when it was applied to physicians and patients in medical office. The study group reported that the OTDMS group and control group showed significant improvements in diabetes knowledge, compliance, reliability, and satisfaction after 6 months; however, there was no significant difference between both groups overall. Especially, by using the OTDMS system for explanation during consultation, “weekly blood sugar level check” compliance and “trying to follow the doctor’s order” reliability was better improved in the OTDMS group. Despite the use of such advanced software, no further significant differences were observed compared with control group, which could be due to the fact that all participants received conventional education and a home blood glucose meter that automatically transmits blood glucose data to the hospital for the study registration. Such factor could work as a kind of intervention, which could result in improvements in the control group as well. However, OTDMS group showed a more significant improvement in “weekly blood sugar level check” and “trying to follow the doctor’s order” in the 6-month trial, which suggest that such system might also prove to be more effective in other aspects including glucose control in a longer trial.

In the meantime, the study requires more results. The study only showed results about compliance and reliability in the view of patients. Some more descriptions regarding how the well-established statistics or graphs from the OTDMS could have affected the doctors’ feedback for education or prescription to the patients during consultation. Such results that explain the benefits to physicians’ use and experience could provide more clues to developing a more advanced software system. Moreover, more than 50% of patients received insulin treatment. Patients with insulin treatment usually show a bigger glucose fluctuation, and so they need a more adapted insulin dose adjustment according to glucose levels. So, if a result about effect of the OTDMS in patients receiving insulin treatment was also described, important information could have been obtained regarding patients who could benefited more from the OTDMS. Similarly, more detailed results according to age, sex and diabetes duration seems to be helpful in interpreting the effect of OTDMS. Interestingly, patients with more than 7.5% of initial HbA1c showed a significant decrease in HbA1c, which suggest that at least the OTDMS could be helpful for patients with HbA1c level outside the target range.

Nevertheless, the study demonstrates that a computer-assisted SMBG system such as OTDMS system can be effective for some factors including compliance and reliability in real clinical consultation. Such systems are expected to be more advanced in near future, therefore various clinical research that demonstrate the clinical efficiency of these systems need to be planned with a long-term view. For example, a software program that can predict HbA1c using the SMBG data or analyse hypoglycemia pattern could be added to such systems and help patient’s self-management as well as physicians’ intensive education and treatment.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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