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ORIGINAL ARTICLE

Performance of a Glucose Meter with a Built-In Automated Bolus Calculator versus Manual Bolus Calculation in Insulin-Using Subjects

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Abstract

Background:

Patients consider multiple parameters in adjusting prandial insulin doses for optimal glycemic control. Difficulties in calculations can lead to incorrect doses or induce patients to administer fixed doses, rely on empirical estimates, or skip boluses.

Method:

A multicenter study was conducted with 205 diabetes subjects who were on multiple daily injections of rapid/short-acting insulin. Using the formula provided, the subjects manually calculated two prandial insulin doses based on one high and one normal glucose test result, respectively. They also determined the two doses using the FreeStyle InsuLinx Blood Glucose Monitoring System, which has a built-in, automated bolus calculator. After dose determinations, the subjects completed opinion surveys.

Results:

Of the 409 insulin doses manually calculated by the subjects, 256 (63%) were incorrect. Only 23 (6%) of the same 409 dose determinations were incorrect using the meter, and these errors were due to either confirmed or potential deviations from the study instructions by the subjects when determining dose with meter. In the survey, 83% of the subjects expressed more confidence in the meter-calculated doses than the manually calculated doses. Furthermore, 87% of the subjects preferred to use the meter than manual calculation to determine prandial insulin doses.

Conclusions:

Insulin-using patients made errors in more than half of the manually calculated insulin doses. Use of the automated bolus calculator in the FreeStyle InsuLinx meter minimized errors in dose determination. The patients also expressed confidence and preference for using the meter. This may increase adherence and help optimize the use of mealtime insulin.

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Abbreviations: (MDI) multiple daily injection

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