Methods of Evaluating the Utility of Continuous Glucose Monitor Alerts

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Abstract

Background:

The evaluation of continuous glucose monitor (CGM) alert performance should reflect patient use in real time. By evaluating alerts as real-time events, their ability to both detect and predict low and high blood glucose (BG) events can be examined.

Method:

True alerts (TA) were defined as a CGM alert occurring within ± 30 minutes from the beginning of a low or a high BG event. The TA time to detection was calculated as [time of CGM alert] – [beginning of event]. False alerts (FA) were defined as a BG event outside of the alert zone within ± 30 minutes from a CGM alert. Analysis was performed comparing DexCom™ SEVEN® PLUS CGM data to BG measured with a laboratory analyzer.

Results:

Of 49 low glucose events (BG ≤70 mg/dl), with the CGM alert set to 90 mg/dl, the TA rate was 91.8%. For 50% of TAs, the CGM alert preceded the event by at least 21 minutes. The FA rate was 25.0%. Similar results were found for high alerts.

Conclusion:

Continuous glucose monitor alerts are capable of both detecting and predicting low and high BG events. The setting of alerts entails a trade-off between predictive ability and FA rate. Realistic analysis of this trade-off will guide patients in the effective utilization of CGM.

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