

Higher Accuracy of Self-Monitoring of Blood Glucose in Insulin-Treated Patients in Germany: Clinical and Economical Aspects

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Abstract

Background:

Accuracy standards of blood glucose (BG) meters are currently under review. Revised standards are expected to tighten accuracy requirements. Regarding clinical and financial impact of BG meter accuracy, very little data are available. The aim of this study was to analyze potential cost savings related to higher accuracy of glucose meters in Germany.

Methods:

As a model for calculation, a reduction of meter error from 20% to 5% was applied. The health economic analysis was based on four main pillars: (1) number of insulin-treated patients; (2) costs for glucose monitoring in Germany; (3) data of a modeling analysis on the impact on hypoglycemic episodes, glycosylated hemoglobin (HbA1c), and, subsequently, myocardial infarctions; and (4) costs of diabetes-related complications in Germany. A reduction of meter error from 20% to 5% was identified to be associated with a 10% reduction in severe hypoglycemic episodes and a 0.39% reduction in HbA1c, which translates into a 0.5% reduction of myocardial infarctions.

Results:

According to the health economic analysis, the reduction in severe hypoglycemic episodes and myocardial infarctions led to cost savings of €24.14 per patient per year. Considering 390,000 type 1 diabetes patients or 2.3 million insulin-treated patients in Germany, these savings could be equal to a reduction in health care expenditures of more than €9.4 million and €55.5 million, respectively.

Conclusions:

Potential cost savings and clinical effects due to higher accuracy of BG meters should provide an impetus to implementation of tighter accuracy standards and development of glucose meters that provide highest possible accuracy.

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Abbreviations: (BG) blood glucose, (CHD) coronary heart disease, (HbA1c) glycosylated hemoglobin, (ISO) International Organization for Standardization, (SMBG) self-monitoring of blood glucose, (UKPDS) United Kingdom Prospective Diabetes Study

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