Improvement of metabolic control and diabetes management in insulin-treated patients results in substantial cost savings for the German Health System

K. Fritzen[1], B. Gutschek[2], B. Coucke[3], K. Zakrzewska[4], M. Hummel[5,6], O. Schnell[1,6]

[1]Sciarc Institute, Baierbrunn, Germany, [2]Lifescan, Johnson & Johnson Medical GmbH, Neuss, Germany, [3] Lifescan, Johnson & Johnson Medical GmbH, Beerse, Belgium, [4]Lifescan, Johnson & Johnson Medical GmbH, Zug, Switzerland, [5]Diabetologische Schwerpunktpraxis Rosenheim, Rosenheim, Germany, [6]Forschergruppe Diabetes e.V., Helmholtz Centre Munich, Munich-Neuherberg, Germany

Background and aims

Self-monitoring of blood glucose (SMBG) with a new blood glucose meter using the ColourSure™ Technology to visualise target range was shown to improve metabolic control and overall diabetes-management of insulin-treated patients. Aim of this economic analysis was to identify cost savings for the German Health System resulting from an HbA1c reduction of 0.69% due to the utilisation of a user-friendly glucose meter with a colour range indicator.

Material & Methods

Baseline- and six month-patient data from an observational study on SMBG were used for risk evaluations using the UKPDS risk engine[1,2] (Table 1). These values were integrated in an economic analysis regarding costs of myocardial infarctions (MI) related to diabetes for the German Health System[3,4] (Table 2). Based on an earlier assessment we combined these calculations with a 10% reduction of severe hypoglycemic episodes[3].

Table 1: Summary of Parameters Incorporated into the Analysis

Insulin-treated patients in Germany	2.3 million
Costs of MI	
Acute	€9,767
Successfully treated MI	€13,799
Hypothetical reduction in severe hypoglycemic events	10%
Costs of severe hypoglycemia	
Ambulance	€520
Hospitalization	€2,380
Average cost	€1,353

Table 2: UKPDS risk engine calculations with patient data from observational study[1,2]

	Baseline	**6 month**
HbA1c	8.68 %	7.99%
Systolic BP	139	139
Total cholesterol	198 mg/dl	193 mg/dl
HDL cholesterol	46.4 mg/dl	46.8 mg/dl
MI	24.7%	21.4%
Fatal MI	18.1%	15.1%

Results

An HbA1c reduction of 0.69% over six month was associated with a 3% decrease of MI in 10 years (Table 1). This decrease would lead to cost savings of €4.90 per patient and year. Considering 2.3 million insulin-treated patients in Germany this 3% reduction of MI could result in annual savings of €11.27 million. Combining the decrease of MI with a 10% reduction in hypoglycemic events[3], these cost savings would increase to €30.61 per patient and year or €70.4 million for 2.3 million insulin-treated patients in Germany (Table 3).

Table 3: Cost Savings per Patient Related to an Improvement in HbA1c of 0.69 %

Annual cost savings per patient		
Hypothetical reduction in severe hypoglycemic episodes	/	10%
	/	€25.71
3% reduction in fatal and nonfatal myocardial infarction	€4.90	€4.90
In total	€4.90	€30.61
Annual savings for the German health care system		
2.3 million insulin-treated patients	€11.28 million	€70.4 million

Conclusion

The improvement of metabolic control and diabetes self-management which was achieved with the ColourSure™ Technology has the potential to generate substantial cost savings for the German Health system underlining the importance of user-friendly methods for SMBG.

References

[1]Schnell *et al*., Impact on Diabetes Self-Management and Glycemic Control of a New Color-Based SMBG Meter. J Diabetes Sci Technol, 2017; [2]Stevens *et al*., The UKPDS risk engine: a model for the risk of coronary heart disease in Type II diabetes (UKPDS 56). Clin Sci, 2001; [3]Schnell *et al*., Higher accuracy of self-monitoring of blood glucose in insulin-treated patients in Germany: clinical and economical aspects. J Diabetes Sci Technol, 2013; [4]Schnell & Erbach, Impact of a reduced error range of SMBG in insulin-treated patients in Germany. J Diabetes Sci Technol, 2014