

## Altered Disease Course after Initiation of Self-Monitoring of Blood Glucose in Noninsulin-Treated Type 2 Diabetes (ROSSO 3)

Hubert Kolb, Ph.D.,<sup>1</sup> Berthold Schneider, Ph.D.,<sup>2</sup> Lutz Heinemann, Ph.D.,<sup>3</sup> Volker Lodwig, Ph.D.,<sup>4</sup> Werner A. Scherbaum, M.D.,<sup>1,5</sup> and Stephan Martin, M.D.<sup>1,6</sup>

### Abstract

#### Background:

Patients with noninsulin-treated type 2 diabetes were documented from diagnosis to determine whether patients taking up self-monitoring of blood glucose (SMBG) are distinct by baseline characteristics, exhibit a different natural disease course, and are treated differently.

#### Methods:

The German multicenter, retrospective cohort study (ROSSO) followed 3268 persons from diagnosis of type 2 diabetes for a mean of 6.5 years. During follow-up, 1912 persons received oral antidiabetic agents (OAD) for at least 1 year, but no insulin. Data were retrieved from patient files of randomly contacted primary care practices.

#### Results:

During follow-up, 742 patients (38.8%) began with SMBG prior to an end point. Initiation of SMBG was followed by improved glycemic control. Patients in the SMBG cohort were treated more often by an internist, younger by a mean of 3 years, and more often male ( $p < 0.001$ , each). A higher percentage of persons in the SMBG cohort were treated with metformin (74.7% vs 65.0%,  $p < 0.001$ ) or changed OAD therapy (66.3% of patients vs 48.3% of patients,  $p < 0.001$ ). SMBG was not accompanied by more comedication. In the SMBG cohort, 68 persons had a clinical end point (myocardial infarction, stroke, foot amputation, blindness, hemodialysis, or all-cause mortality) (9.2%) compared to 155 persons (13.2%) in the cohort without SMBG ( $p = 0.04$  after multivariate adjustments).

#### Conclusion:

This first large documentation of OAD-treated persons from diagnosis for 6.5 years indicates that the use of SMBG is associated with younger age at diagnosis, a higher prescription rate of metformin, more frequent changes of oral therapy, and a lower risk of a clinical end point.

*J Diabetes Sci Technol* 2007;1(4):487-495

**Author Affiliations:** <sup>1</sup>German Diabetes Center at the Heinrich-Heine-University, Düsseldorf, Germany; <sup>2</sup>Institute of Biometry, Medical University Hannover, Germany; <sup>3</sup>Profil Institute for Metabolic Research, Neuss, Germany; <sup>4</sup>Institute for Medical Informatics and Biostatistics, Basel, Switzerland; <sup>5</sup>Department of Endocrinology, Heinrich-Heine-University, Düsseldorf, Germany; and <sup>6</sup>West German Diabetes and Health Centre, Hospital Gerresheim, Düsseldorf, Germany

**Abbreviations:** (CI) confidence interval, (FBG) fasting blood glucose, (HR) hazard ratio, (LDL) low-density lipoprotein, (OAD) oral antidiabetic agents, (SMBG) self-monitoring of blood glucose

**Keywords:** diabetes therapy, diabetic complications, epidemiology, mortality, self-monitoring of blood glucose, type 2 diabetes

**Corresponding Author:** Prof. Dr. rer. nat. Lutz Heinemann, Profil Institut für Stoffwechselforschung, Hellersbergstr. 9, D-41460 Neuss, Germany; email address [lutz.heinemann@profil-research.de](mailto:lutz.heinemann@profil-research.de)