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ORIGINAL ARTICLE

In Type 2 Diabetes Patients, Insulin Glargine Is Associated with Lower Postprandial Release of Intact Proinsulin Compared with Sulfonylurea Treatment

Stefan Pscherer, M.D.,[1] Martin Larbig, Ph.D.,[2] Berndt von Stritsky, M.D.,[2] Andreas Pfützner, M.D., Ph.D.,[3] and Thomas Forst, M.D.[3,4]

Abstract

Objective:

Our objective was to investigate how postprandial processing of intact proinsulin is influenced by different pharmacological strategies in type 2 diabetes mellitus (T2DM).

Materials/Methods:

This exploratory, nonrandomized, cross-sectional study recruited T2DM patients and healthy subjects. Upon recruitment, eligible T2DM patients had been treated for ≥6 months with insulin glargine (GLA) plus metformin (MET), sulfonylureas (SU) plus MET, or dipeptidyl-peptidase-4 inhibitors (DPP-4-I) plus MET. Blood samples were drawn from study participants after an 8 h fast and at regular intervals for up to 5 h after consumption of a standardized meal. Study endpoints included postprandial intact proinsulin and insulin levels and the insulin/proinsulin ratio.

Results:

As expected, postprandial secretion of proinsulin was greater in all T2DM treatment groups than in healthy subjects ($p < .01$ for all comparisons). Postprandial release of proinsulin was significantly greater in T2DM patients treated with SU plus MET than in those treated with GLA plus MET ($p = .003$). Treatment with DPP-4-I plus MET was associated with reduced proinsulin secretion versus SU plus MET and an increased insulin/proinsulin ratio versus the other T2DM groups.

Conclusions:

Treatment of T2DM with GLA plus MET or DPP-4-I plus MET was associated with a more physiological postprandial secretion pattern of the β cell compared with those treated with SU plus MET.

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Author Affiliations: [1]Klinikum Traunstein, Diabetes Department, Traunstein, Germany; [2]Sanofi, Berlin, Germany; [3]Institute for Clinical Research and Development, Mainz, Germany; and [4]University Mainz, Mainz, Bayern, Germany

Abbreviations: ($AUC_{0–300}$) area under the concentration time curve from 0 to 300 min, (DPP-4-I) dipeptidyl-peptidase-4 inhibitors, (GLA) insulin glargine, (GLP-1) glucagon-like peptide-1, (HbA1c) glycated hemoglobin, (MET) metformin, (OAD) oral antidiabetic drug, (OGTT) oral glucose tolerance test, (PAI-1) plasminogen activator inhibitor-1, (SU) sulfonylureas, (T2DM) type 2 diabetes mellitus

Keywords: dipeptidyl-peptidase-4 inhibitors, insulin glargine, postprandial proinsulin, sulfonylureas

Corresponding Author: Thomas Forst, M.D., Institute for Clinical Research and Development, Parcusstrasse 8, D-55116 Mainz, Bayern, Germany; email address ThomasF@ikfe.de