

Comparison of Insulin Diluent Leakage Postinjection Using Two Different Needle Lengths and Injection Volumes in Obese Patients with Type 1 or Type 2 Diabetes Mellitus

Debra A. Ignaut, R.N., B.S., C.D.E., and Haoda Fu, Ph.D.

Abstract

Background:

Smaller gauge, shorter needles have been shown to be as safe and effective for insulin delivery as longer needles in many patients. However, in obese patients with diabetes, results have been inconsistent with regard to the impact of needle length on leakage of injectate.

Methods:

A single-blind, randomized, two-period, crossover study compared injections with 5 mm needles to 8 mm needles regarding leakage, pain, bleeding, and bruising at abdominal injection sites in obese patients with diabetes using 20- and 60-unit (U) volume equivalent injections of sterile insulin diluent.

Results:

Fifty-six patients (54% male; mean age 56 years; mean body mass index of 36 kg/m²) with type 1 ($n = 13$) or type 2 ($n = 43$) diabetes participated. Median leakage (U) was similar for both needles [0.04 (5 mm/20 U) vs 0.02 (8 mm/20 U), $P = .32$; and 0.04 (5 mm/60 U) vs 0.02 (8 mm/60 U), $P = .48$]. Pain scores (mean) were similar [1.27 (5 mm/20 U) vs 1.14 (8 mm/20 U), $P = .75$, and 1.68 (5 mm/60 U) vs 0.95 (8 mm/60 U), $P = .21$]. The proportion of injections with bleeding [10.8% (5 mm/20 U) vs 5.83% (8 mm/20 U), $P = .23$, and 4.92% (5 mm/60 U) vs 6.56% (8 mm/60 U), $P = .73$] and the proportion of patients with bruising [8.11% (5 mm/20 U) vs 10.81% (8 mm/20 U), $p = .56$, and 21.05% (5 mm/60 U) vs 26.32% (8 mm/60 U), $p = .65$] at injection sites were similar. Mean bruise size (mm) [0.73 (5 mm/20 U) vs 2.68 (8 mm/20 U), $P = .23$; and 1.11 (5 mm/60 U) vs 4.21 (8 mm/60 U), $P = .08$] at injection sites was similar.

Conclusions:

This study supports the suitability of the 5 mm needle for the injection of insulin in obese patients with diabetes.

J Diabetes Sci Technol 2012;6(2):389-393

Author Affiliation: Eli Lilly and Company, Indianapolis, Indiana

Abbreviations: (BMI) body mass index, (GEE) generalized estimating equation, (SAE) serious adverse event, (SD) standard deviation, (U) unit, (VAS) Visual Analog Box-21 Scale for Pain

Keywords: diabetes, leakage, needle length, obesity

Corresponding Author: Debra A. Ignaut, R.N., B.S., C.D.E., Eli Lilly and Company, Drop Code 6024, Indianapolis, IN 46285; email address dignaut@lilly.com