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Jet-injected insulin is associated with decreased antibody production and postprandial glucose variability when compared with needle-injected insulin in gestational diabetic women.

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Abstract

OBJECTIVE:

To elucidate the glycemic response and antibody formation in gestational diabetic women treated with insulin injected by a needle or a jet. The American Diabetes Association's position statement on jet injectors raised the concern that "insulin could be denatured as a result of forceful injection through a tiny port, which could lead to an increase in antibody formation" (Diabetes Care 11:600, 1988). However, the pharmacokinetics of jet-injected insulin suggest that it might be useful in controlling postprandial glucose levels.

METHODS:

We randomized 20 women with gestational diabetes mellitus (< 34 wk gestation) who required insulin to receive either jet-injected or needle-injected human NPH and regular insulin. Variables of interest were evaluated at the start of therapy, weekly until delivery, and 6-wk postpartum that included: 1) insulin antibodies in the mother and her infant, 2) HbA1c, 3) insulin dose, 4) fasting and postprandial glucose levels, and 5) subject acceptance and preference.

RESULTS:

Of the 10 women in the needle group, 6 developed significant insulin antibodies compared with 1 of 10 in the jet group ($P < 0.001$). HbA1c and insulin doses were the same in both groups. During the test meal, glucose levels in the jet group were significantly lower ($P < 0.01$), yet none of the women in the jet group experienced blood glucose < 70 mg/dl (3.89 mM) at 3-4 h after the meal, compared with 5 in the needle group ($P < 0.001$). Jet injection was associated with less variability ($P < 0.001$) in postprandial glucose values but slightly greater variability ($P < 0.05$) in fasting glucose. Jet-injected insulin was more readily accepted by subjects than needle injections.

CONCLUSIONS:

Jet injection is associated with a diminished antibody response and postprandial variability compared with needle-injected insulin. Thus, this warrants consideration as a therapeutic option for women with gestational diabetes mellitus and may also be applicable to nonpregnant, insulin-requiring diabetic patients.

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