ABSTRACT
Poster Presentation 917

Basal/Bolus With Prandial Inhaled Technosphere® Insulin (TI) Plus Insulin Glargine QD vs Biaspart 70/30 Insulin BID in T2 DM Inadequately Controlled on Insulin With/Without Oral Agents

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Background and aims: Technosphere® Insulin (TI) is a fast-acting inhaled insulin with a pharmacokinetic profile well suited for earlier control of postprandial plasma glucose (PPG). This randomized, active-control, parallel-group study compared the efficacy and safety of basal/bolus prandial TI plus bedtime glargine insulin (G) vs premixed biaspart 70/30 insulin BID (BPA 70/30) in type 2 diabetes mellitus inadequately controlled (HbA1c > 7.0% and ≤ 11.0%) despite insulin with or without oral antihyperglycemic therapy.

Materials and methods: Subjects were randomized to a 52-week course of TI+G (n = 334) or BPA 70/30 (n = 343) with insulin adjustments according to investigator discretion to achieve predefined glycemic goals but without enforcing a structured titration regimen. Primary outcome was change in HbA1c. Secondary objectives were proportion of subjects reaching specific HbA1c levels, PPG, and fasting plasma glucose (FPG).

Results: Mean baseline characteristics were similar for TI+G and BPA 70/30 (age 55.9, 55.9 years; disease duration 13.1, 13.6 years; baseline HbA1c 8.7%, 8.7%; BMI 31.55, 31.07 kg/m^2). HbA1c was reduced by 0.58% and 0.70% in the TI+G and BPA 70/30 groups (intent-to-treat last observation carried forward), respectively, and the proportion of subjects achieving HbA1c < 7.0% were comparable between treatments (22% vs. 27%). Mean FPG at week 52 was 7.8 mmol/L for the TI+G group and 8.7 mmol/L for the BPA 70/30 group, and the FPG change from baseline was 2.0 vs. 1.0 mmol/L (p = 0.0029). The absolute 1-h PPG (9.5 vs. 11.6 mmol/L; p <0.0001) was significantly lower with TI+G. TI+G produced significantly less weight gain (0.9 vs. 2.5 kg; p = 0.0002) and significantly less mild/moderate and severe hypoglycemia (Table 1). The final insulin doses were TI, 198 U (approximately equivalent to 53 IU of rapid-acting insulin); G, 47 IU; and BPA 70/30, 88 IU. Mean changes from Baseline to Week 52 in forced expiratory volume, forced expiratory vital capacity, and carbon monoxide diffusing capacity were similar in the two groups.

Conclusion: TI+G vs BPA 70/30 resulted in comparable HbA1c reductions but lower 1-h PPG with less weight gain and less hypoglycemia.

Table 1. Hypoglycemia (Safety Population)

Category of Hypoglycemia	Incidence				Event Rates		
	TI+G	BPA 70/30	Odds Ratio	*p Value*	TI+G	BPA 70/30	*p* Value
Mild/ Moderate (%)	48	69	0.417	<0.001	0.40 per subject-month	0.59 per subject-month	0.0029
Severe (%)	4	10	0.409	0.0066	0.72 per 100 subject-months	2.19 per 100 subject-months	0.0591
Total (%)	48	69	0.417	<0.001	0.41 per subject-month	0.61 per subject-month	0.0027