Comparison Study of Insulin Glargine and Insulin Detemir on Glycaemic Control in Outpatients with Type 2 Diabetes Mellitus

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Background

The number of outpatients with type 2 Diabetes Mellitus (DM) in Indonesia is increasing and so does the need of basal insulin. There is now a newer generation of basal insulin, i.e detemir, which its effectivity has not been evaluated yet. Basal insulin treatment should be started as early as possible when a patient's glycated hemoglobin (A1C) levels are not at goal with use of other therapies [1] Aim of this study was to compare the efficacy of insulin glargine and detemir.

Methods

This cohort study was conducted prospectively in outpatients with type 2 DM. Patients were followed for 12 weeks, by monthly home visit. Patient was assigned to have glargine or detemir insulin. Patient's respond to both insulin was assessed by measuring A1C. In addition to respond, compliance was also evaluated by performing survey with specific questionnaires. Glycaemic control measures including glycated haemoglobin (A1C), fasting and 2 hours post prandial plasma glucose.

Results

The baseline characteristics, including age, sex, body mass index, mean dosage and glycated haemoglobin (A1C), were not statistically different in both basal insulin group (Table 1). Compared to insulin detemir, insulin glargine resulted in significant higher reduction of A1C (0.75 % and 0.24 %, respectively) at week 12 compared to baseline. However, there were no statistically differences in reduction of the mean fasting and 2 hour post prandial plasma glucose in both group. In both group of treatment, most of the patients remained hyperglycaemic. (Table 2). Despite, most of the patients attended clinics and took basal insulin regularly. The results of the compliant survey, found that most of the patients did not comply in diet restriction, oral anti diabetes and exercise (Table 3).

Discussion

Basal insulin glargine could reduce A1C significantly higer than detemir (p = 0,477), probably because of relatively low dosage of basal insulin detemir (0.22 unit/kg body weight). While detemir's duration of action is dose dependent, it can act for 12 hours with dosage of 0.2 unit/kg, 20 hours with dosage of 0.4 unit/kg, and 23 hours with dosage of 0.8 unit/kg. [2,3] There were no statistically differences in mean fasting plasma glucose as well as mean 2 hours pp, probably because of patients' non compliance. Inspite of higher proportion of patients who complied in taking medicines and visiting the doctor in detemir group than in glargine group, more patients did not comply in diet restriction and exercise. Most of the patients remained hyperglycaemic, probably because of the A1C at baseline was relatively high for the two groups and the periode of study was only 12 weeks.

Conclusions

Insulin glargine was more effective in lowering blood glucose, according to A1C result. Randomized control trial and long term follow up is required to determine the risk-benefit ratio of the glycaemic improvement, side effects, changes in body weight, and plasma insulin concentration.

Table 1. Baseline patient's characteristics in insulin glargine and insulin detemir groups

Patient's Characteristics	Glargine	Detemir
N (% men / % women)	25 (32 / 68)	16 (38 / 78)
Age (year) *	61 (28 – 79)	59 (42 – 73)
Weight (kg) *	65,3 (40,3 - 102,4)	64,5 (48,1 – 89,2)
Body Mass Index (kg / m2) *	26,8 (18,1 – 36,3)	25,7 (19,5 - 30,9)
HbA1C (%) *	9,8 (6,4 – 13,8)	8,3 (6,4 – 10,9)
History / Duration of Diabetes (year) *	12 (0,5 – 26)	11 (0,25 – 36)
Mean Basal Insulin Dosage/Day (unit/kg) *	0,21 (0,10 – 0,42)	0,22 (0,10 – 0,46)
Mean Rapid Acting Insulin/Day (unit/kg) *	0,25 (0,03 – 0,46)	0,29 (0,06 – 0,43)

* mean (range)
• There were no statistically

Table 2. Comparison of Glycaemic Control of Basal Insulin

Table 3. The results of the compliant survey to patient's compliance

Type of Basal Insulin	Type of Patient's Compliance	Month I (%)	Month II (%)	Month III (%)
	Diet Restriction	48	52	56
	Visit the Doctor	88	88	88
Detemir	Medicines	90	90	90
	Exercise	50	50	40

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