

## Structured Education and Appropriate Pharmacologic Intervention in a Day Clinic Improves Glycemic Control in Adult Patients With Diabetes

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Adult diabetic patients who receive structured education in addition to appropriate pharmacologic intervention have significant and lasting improvements in glycemic control compared with patients who receive usual care. Velimir Altabas, MD, Department of Endocrinology, Diabetes and Metabolic Diseases, Clinical Hospital Center, Zagreb, Croatia, presented the results of a study designed to assess the efficacy of a combined structured approach in a diabetes day clinic compared with periodic visits to a typical outpatient clinic.

The study included adult diabetic patients (~60% men; mean age ~60 years) treated at a day clinic (n = 140) or in the typical outpatient setting (n = 140). Patients at the day clinic received the usual care provided in an outpatient setting (eg, treatment adjustment and screening for diabetic complications), along with structured theoretical and practical education on topics such as nutrition and diet therapy, proper physical activity, weight control, hypoglycemia, diabetic neuropathy, and diabetic foot. They also watched demonstrations on the use of insulin pens and glucose self-monitoring devices and received psychological support. The control group received only the usual care provided in the outpatient clinic. Routine laboratory measures relevant to glycemic control (eg, fasting and postprandial blood glucose, HbA<sub>1c</sub>, and lipid profile) and body mass index (BMI) were assessed at baseline and after 3 months in all patients. Therapy was adjusted as needed. Patients in both groups were educated about blood glucose monitoring.

Most (≥95%) participants had type 2 diabetes with a mean duration of about 10 years. Patients treated at the day clinic had significantly higher fasting blood glucose and HbA<sub>1c</sub> levels at baseline (both  $P < .001$ ). Postprandial blood glucose levels (mean range, 12 - 13 mmol/L<sup>2</sup>) and BMI (~31 kg/m<sup>2</sup>) were not significantly different.

At the 3-month control visit, postprandial blood glucose ( $P = .05$ ), HbA<sub>1c</sub> ( $P < .001$ ), high-density lipoprotein (HDL) cholesterol ( $P < .001$ ), and BMI ( $P = .003$ ) levels were significantly improved in patients treated in the day clinic. There were no significant changes in the patients treated in the outpatient setting.

Compared with patients treated in the outpatient setting, patients seen at the day clinic had significantly

Table 1. Comparison of Laboratory Measurements at 3 Months<sup>a</sup>

Parameter	Day Clinic	Outpatient Clinic	P Value
Fasting blood glucose, mmol/L	8.34 ± 2.45	8.92 ± 3.03	.03
Δ Fasting blood glucose, mmol/L	-2.25 ± 4.28	-0.09 ± 3.07	< .001
Postprandial blood glucose, mmol/L	10.70 ± 4.43	11.28 ± 4.59	.001
Δ Postprandial blood glucose, mmol/L	-2.85 ± 6.22	-0.11 ± 3.94	< .001
HbA <sub>1c</sub> , %	7.24 ± 1.51	7.33 ± 1.58	.67
Δ HbA <sub>1c</sub> , %	-1.75 ± 2.38	+0.07 ± 1.05	< .001
Total cholesterol, mmol/L	5.53 ± 1.35	5.18 ± 1.21	.10
LDL, cholesterol, mmol/L	3.33 ± 1.27	3.05 ± 1.14	.18
HDL, cholesterol, mmol/L	1.34 ± 0.36	1.244 ± 0.36	.13
Triglycerides, mmol/L	2.023 ± 1.11	2.36 ± 2.16	.25
BMI, kg/m <sup>2</sup>	30.11 ± 5.33	30.83 ± 4.82	.26

BMI, body mass index; HDL, high-density lipoprotein; LDL, low-density lipoprotein.

<sup>a</sup>Independent sample *t*-test.

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lower fasting blood glucose levels ( $P = .03$ ) and a significantly more profound drop in HbA<sub>1c</sub> levels ( $P < .001$ ) at the 3-month control visit. Table 1 presents a comparison of all laboratory values for the 2 groups at 3 months.

This study is limited by the fact that only short-term effects were assessed. Further research is needed to evaluate the long-term effects of structured diabetes education in achieving optimal glycemic control in adult patients.

Like outpatient clinics, diabetes day clinics offer specific care for diabetic patients—but the total time spent providing care to patients is more extensive, better structured, and focused on specific goals. Given that the pharmacologic intervention was the same for both groups in this study, it appears that the addition of a structured educational component provides added value to patients.



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