

Evaluation of a teaching and treatment program in more than 4000 type 2 diabetic patients after introduction of reimbursement policy for physicians.

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Patient education in diabetes has become an integral part of diabetes management (1-3). Systematic reviews report the best results – in terms of improved metabolic control, weight loss and diabetes-related knowledge – in cases where mainly nurses provide patient education combined with structured and regular patient review. Therefore patient education is recommended as a necessary component in promoting good diabetes control (4,5). In 2000 the Styrian Diabetes Type 2 Education project was implemented province-wide in the Austrian province of Styria. Until then no formal implementation or reimbursement of educational efforts had been provided in the Austrian health care system. The primary objective of the project was to provide free access to a structured diabetes teaching and treatment program (DTTP) at the primary health care level throughout the province to patients with type 2 diabetes who are not using insulin for glycemetic control. Here, we report on its overall acceptance and effectiveness 4 years after its systematic implementation.

Research Design and Methods

The Styrian Diabetes Type 2 Education project is a combined intervention consisting of a structured diabetes teaching and treatment program (DTTP) and a special training for the educating staff. The DTTP is a 16 hour course, conducted at the primary health care level. It is well evaluated and transferable (6-10). The program covers 9 education areas: basic diabetes information, self-monitoring, medication and hypoglycaemia, diet, foot care, physical activity, sick day rules and late complications. Training of the educators (physicians and diabetes educators) focuses on the discussion of evidence based therapy and therapy goals. Role playing techniques are used to improve patient education skills. One year after the initial teaching program, a 2 hour refresher course including a follow-up assessment is held. The remuneration for one training course (6 to 12 participants) is US\$ 870 and US\$ 183 for the follow-up.

The project is supported by a quality management concept using a documentation form including most of the data proposed by the European Diabetes Indicator Project (EUDIP) (11). This form has to be completed for each patient at baseline and at follow-up. Every three months a benchmarking report is compiled and sent to each participating physician. An annual report analyzes the effects of the program, suggesting adaptations to the steering committee, which reviews current data biannually. A postgraduate meeting is offered twice a year.

Results

During 4 project years, 120 physicians and 52 diabetes educators taught the DTTP course area-wide to 4396 patients with type 2 diabetes (55% female, age[years] 63.8 ± 10.7 , diabetes duration[years] 5.0 ± 6.2 , BMI[kg/m²] 29.7 ± 5.1 , baseline HbA1c[%] 7.6 ± 1.6 [mean \pm SD]). 2122 (48%) attended the follow-up assessment. All target parameters improved significantly ($p < 0.001$) after one year (HbA1c[%] -0.4 ± 1.3 , BMI[kg/m²] -0.4 ± 2.4 , body weight[kg] -1.1 ± 6.2 , systolic BP[mmHg] -1.8 ± 19.3 , diastolic BP[mmHg] -1.1 ± 10.8 , cholesterol[mmol/l] -0.1 ± 1.1 , LDL[mmol/l] -0.2 ± 0.9 , triglycerides[mmol/l] -0.1 ± 1.8 [mean \pm SD]). Changes in glucose lowering treatments are illustrated in Figure 1. Although insulin therapy was not an inclusion criterion, 1.1% of the patients were already on insulin at baseline and 6 % at follow up. 66% of the patients had eye examinations within one year prior to the course and 69% ($p=0.04.$) at follow-up. The rate of foot examinations did not change significantly (86% to 85% at follow-up, $p=0.28$). More information on the project, the documentation form, statistical analysis, baseline characteristics, change in A1c and treatment for arterial hypertension and blood lipids are available in an online appendix (available at <http://care.diabetesjournals.org>).

Conclusions

Our evaluation demonstrates that a teaching and treatment program for patients with type 2 diabetes can be implemented successfully throughout the area at the primary health care level. Our large scale cohort showed an improvement of all target parameters with an HbA1c reduction comparable to previous randomized studies (12,13). The relative increase of patients treated with biguanides at follow-up may account partly for the decrease of HbA1c and for the observed weight reduction. Apart from the effects of the training program, including improved drug intake compliance, increase of physical activity patterns and changes in nutritional habits (9,10), the metabolic improvement could be further explained either by an increase in medication dosage or by initiation of insulin therapy. The low follow-up rate is a limitation of the project. Randomized controlled trials on similar topics obtain follow-up rates of at least about 80% (2), while in interrupted time series and before-and-after studies, which are more comparable to our study, these rates are seldom achieved. However, sustained implementation of education programs within the health system has rarely been subject to evaluation in the literature. Through a standardized questionnaire sent to participating physicians, reasons for the low follow-up rate were

determined. The most common response was that operating expenses for documentation are too high and that remuneration for the follow-up examination is not attractive. Otherwise, based on physicians' opinions, patients do not show up at follow-up because of loss of motivation, a guilty conscience because they did not modify their behavior after the training course, or they do not see the sense of a follow-up, having already heard everything in the initial course. It is possible that the patients lost to follow-up were less successful in reaching their treatment targets than the others. One can speculate whether a personal reminder for patients, as installed for physicians, would have further increased the follow up rate.

The introduction of a structured documentation led to a more accurate and comprehensive monitoring of the patient. Eye examination rate (69%) was clearly higher compared to a survey by Saaddine and colleagues (57.6%; 14). The early educational intervention and intensified screening and treatment for secondary complications in our program will likely postpone the outbreak of diabetes-related co-morbidity as previously shown in disease management programs (15,16).

In conclusion, our investigation demonstrates, by means of improved intermediate outcome parameters, that a teaching and treatment program for patients with type 2 diabetes who are not using insulin for glycemic control was successfully implemented province-wide at the primary health care level.

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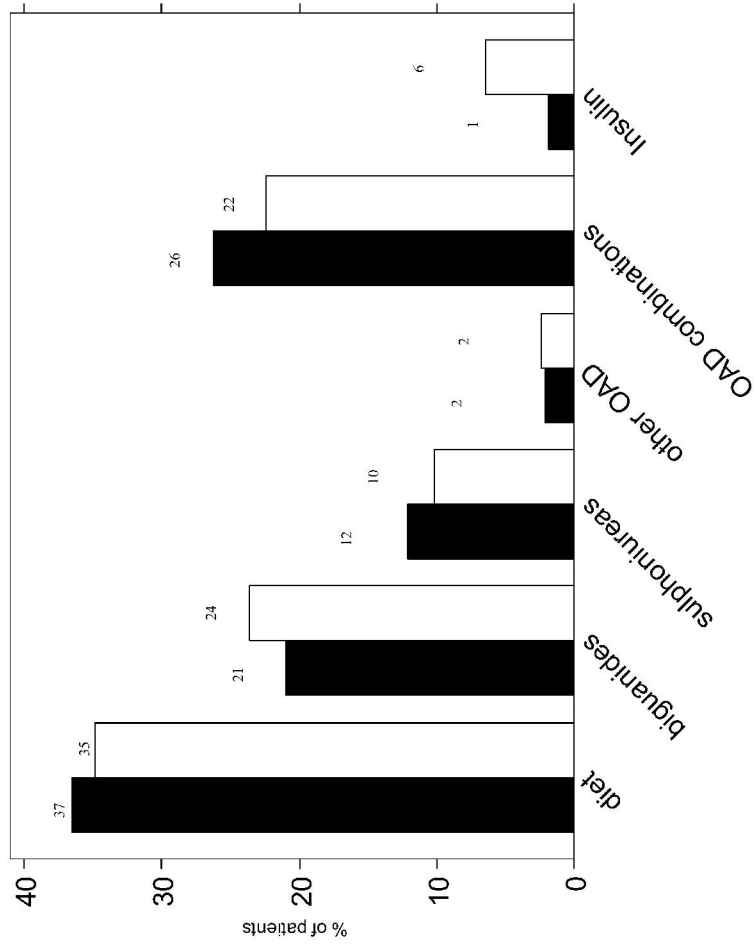


Figure1: Change in hypoglycemic treatment before training and at follow-up. Black bars: before education, white bars: follow up. Insulin denotes insulin use, either as single therapy or in combination with other oral antidiabetic agents (OAD). Among combinations of OAD, the combination of metformin and sulphonylureas was most frequent, and was prescribed in 55% and 58% of patients receiving more than one OAD at baseline and follow-up, respectively.