Group Education Courses in Recently Diagnosed Patients With T2DM

Written by Kate Mann

Type 2 diabetes mellitus (T2DM) can be challenging for patients to self-manage and can lead to stress that affects their health-related quality of life. The perception of illness is a close determinant of health behavior and outcomes; therefore, researchers in the Netherlands used illness perceptions as the starting point in devising a new support program for patients and their partners in the first years of living with T2DM.

Anne L. van Puffelen, MSc, Netherlands Institute for Health Services Research, Utrecht, Netherlands, presented a poster on behalf of the Diacourse study group outlining results of a randomized controlled trial (NTR3302) of this support program administered to recently diagnosed patients with T2DM. The program consisted of 3 monthly group-based sessions led by 2 trained nurses that included patients and their partners and 1 booster session after 3 months. Patients who participated in this program were compared with patients who had only a single educational meeting.

The premise behind the intervention was that increasing patients' knowledge, experience, and skills would positively affect their perceptions of illness by increasing their feelings of empowerment. It was thought that this could improve the self-management of symptoms, resulting in enhanced health-related quality of life. Patients' partners were included in the sessions so that their level of knowledge, experience, and skills regarding T2DM treatment issues would affect their perceptions of the patients' illness and the quality of their support.

Patients aged 18 to 85 years were eligible for the study if they had been diagnosed with T2DM within the past 1 to 3 years and had been experiencing some degree of difficulty in meeting the challenge of their diagnosis, as assessed by use of a 3-item screening tool. The primary outcome was the perceived level of diabetes distress on a scale of 0 to 100 and the number of days per week engaged in activities of self-care (exercise, foot care, and diet). An analysis of the results focused on differences between scores at screening and immediately after the third group session. Treatment persistence was determined from results after 6 months of follow-up. No *P* values were provided, but results claimed to be statistically significant were indicated in bold text (Table 1).

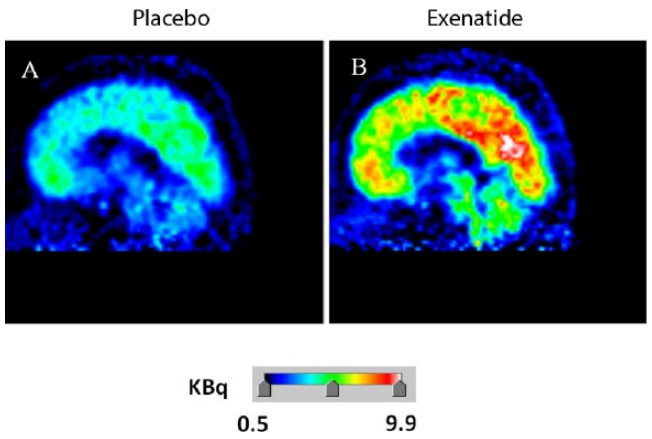
Table 1. Results of Intervention Support Program for Newly Diagnosed Patients With T2DM[a]

	Intervention, n = 80			Control, n = 84		
Primary Outcomes	**T0**	**T1**	**T2**	**T0**	**T1**	**T2**
Diabetes distress (0-100)	12.8	1.64	−0.35	13.9	−0.13	−1.45
Self-care, d (0-7)						
Exercise	4.5	**0.34**	−0.09	4.3	**−0.38**	−0.07
Foot care	1.3	0.40	0.25	1.3	0.11	0.25
Diet						
General	5.3	**0.09**	−0.11	5.1	**−0.16**	−0.32
Fruit/vegetables	5.2	**0.56**	0.05	5.4	**−0.01**	0.31
Low fat	5.0	−0.25	−0.50	4.6	0.16	−0.54
Secondary Outcomes (0-5)						
Illness perception						
Consequences	2.5	**0.25**	0.20	2.5	**0.05**	0.03
Personal control	3.9	**−0.01**	−0.06	3.7	**−0.04**	0.09
Attitude: seriousness	3.4	**0.21**	0.13	3.3	**0.06**	0.09
Support						
Active engagement	3.4	**0.12**	−0.02	3.1	**−0.08**	0.01
Overprotection	1.9	**0.03**	−0.03	1.8	**−0.04**	0.01
Empowerment	3.6	**0.23**	**0.21**	3.6	**0.02**	**0.03**

[a]Significant differences in change scores between conditions are in bold. Only significant secondary outcomes are presented in table.

Results demonstrated that the intervention that focused on illness perception issues had significant positive effects on exercise and dietary behaviors as compared with the control group, when measured directly after the intervention. The intervention had similar positive short-term effects on increasing perceptions of T2DM as a serious condition and in activating partners' levels of support. While none of these effects were observed as significant in the 6-month follow-up, significant increases in feelings of empowerment regarding T2DM management as compared with the control group were sustained for 6 months following the intervention sessions.

Figure 1. Effect of Exenatide on Glucose Levels in the Brain



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Exenatide Increases Glucose Uptake in Brain Areas Involved in Glucose Homeostasis and Food Intake

Written by Dennis Bittner

Amalia Gastaldelli, PhD, Research Director of the Cardiometabolic Risk Unit at the Institute of Clinical Physiology, CNR, Pisa, Italy, and Adjunct Associate Professor at the University of Texas Health Science Center, San Antonio, Texas, USA, presented results from the Effect of Exenatide on Brain, Adipose Tissue, Pancreas, and Liver Function study [NCT01588418], of which she was the principal investigator. This is a phase 4 clinical trial that aimed to evaluate the effect of a single injection of exenatide (a glucagon-like peptide-1 [GLP-1] agonist) on cerebral glucose metabolism during an oral glucose tolerance test (OGTT).

GLP-1 is secreted in response to food ingestion. The molecule stimulates insulin secretion, suppresses glucagon secretion, and delays gastric emptying [Campbell JE, Drucker DJ. *Cell Metab* 2013; Nauck et al. *Diabetologia* 2011; Holst JJ. *Curr Opin Pharmacol* 2013]. GLP-1 also has effects outside the pancreas, including suppression of appetite [Gejl et al. *Basic Clin Pharmacol Toxicol* 2014]. The action of GLP-1 on brain glucose metabolism has been hypothesized but has not yet been established [Alvarez et al. *J Neurochem* 2005]. A few studies have looked for effects of GLP-1 on human brain metabolism [Pannaciulli et al. *Neuroimage* 2007; Lerche et al. *Diabetes* 2008; Gejl et al. *J Cereb Blood Flow Metab* 2012], but none of these examined response to a glucose load.

In this phase 4 clinical trial, a total of 15 men, either without diabetes and with impaired glucose tolerance or with newly diagnosed type 2 diabetes mellitus (T2DM) at screening, each underwent 2 double-blind studies in randomized order consisting of subcutaneous injection of exenatide 5 µg or placebo 30 minutes before OGTT. Brain imaging was performed by positron emission tomography beginning 60 minutes after intravenous administration of the radioactive glucose analog ^{18}F-FDG simultaneous with oral glucose 75 g and [U- ^{13}C] glucose 1.5 g.

Patients who received exenatide displayed about 40% more glucose uptake in the brain overall, as well as in the frontal, temporal, parietal, and occipital lobes. On average, glucose was markedly higher in areas of the brain known to be involved in glucose homeostasis, such as the limbic system, insula, and putamen. A similar trend was seen for areas associated with the food-intake reward system, with higher uptake in the orbitofrontal cortex, the thalamus, the anterior and posterior cingulate, and, again, the putamen and limbic system (Figure 1; $P < .05$). Dr Gastaldelli noted that uptake in the hypothalamus, on the contrary, was distinctly lower.

Dr Gastaldelli said that the question of whether endogenous glucose production (EGP) is controlled by the brain is still a matter of debate and that the researchers had also looked for clues on the topic of EGP regulation by the brain in the study data. Although a correlation between oral glucose rate of appearance and glucose uptake in areas implicated in glucose homeostasis with exenatide treatment was noted ($R^2 = 0.642$; $P < .009$), no correlation between suppression of EGP and cerebral glucose uptake in the areas implicated in glucose homeostasis was observed.

In conclusion, Dr Gastaldelli stated that, overall, the results of the trial demonstrate the profound effect that exenatide exerts on cerebral glucose metabolism following ingestion of an oral glucose load.