



Stress management training as related to glycemic control and mood in adults with Type 1 diabetes mellitus

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Abstract

Relationships between attending a stress management and relaxation-training program, glycemic control (HbA_{1c}) and mood were examined in two randomised groups of 31 persons with Type 1 diabetes. The program involved group-education 2 h a week for 14 weeks. Whereas one group received the program, the other acted as a control group and received the program later. HbA_{1c} was measured and subjects filled out a mood adjective checklist before the start of intervention and both 1 month and 1 year after completing it. In both groups, significant positive mood changes were obtained, but no significant changes in HbA_{1c} values occurred. No significant relationship was found between measures of change in HbA_{1c} and of changes in mood. For those attending the group-sessions less frequently, the HbA_{1c} values were significantly worse on each of the three measurement occasions than the values of those attending more frequently. The effectiveness of the program, with its failure to improve glycemic control but enhancing the mood of participants, is discussed in terms of characteristics of the sample and various methodological issues as well as in comparison with results of similar studies involving Type 1 and Type 2 diabetes.

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1. Introduction

Type 1 diabetes mellitus presents a challenge both to patients and to health care professionals and considerable efforts have been directed at

developing means of enhancing patients' adherence to a proper regimen (e.g., of regular insulin intake, self-monitoring of blood glucose, eating habits, and exercise) and thus of improving their chances of maintaining better glycemic control. Nevertheless, poor glycemic control, a risk factor for the development of both acute and serious long-term complications, has been documented repeatedly [1–4].

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In recent years psychosocial factors have been recognized as being important both for adherence to the diabetes regimen and for glycemic control [5]. Stress, for example, has been found in several studies to be related to poor glycemic control [6–9]. The mechanisms involved in the relationship between stress and glycemic control have been proposed to be of partly psychological and partly physiological origin. Stress can have a negative impact on mood and thus disrupt behaviors of importance for managing the diabetes regimen. Concerning physiological mechanisms, on the other hand, there is accumulating evidence that stress can have stimulatory effects on insulin antagonists such as cortisol, adrenaline, glucagon and growth hormone [10,11]. Due to suggested links between stress and glycemic control, the ability to handle stress in daily life appears to be important for persons with diabetes as regards both the disease and general well being.

The aim of the present study was to examine the impact of a stress management and relaxation-training program on glycemic control and mood in adult out-patients with Type 1 diabetes.

2. Materials and methods

2.1. Subjects and general procedure

The study was approved by the Ethical Committee of Linköping University. During their regular visit at the diabetes clinic, patients were informed about the forthcoming stress management program by the diabetes physician or by the diabetes nurses. In addition, information about the program was published in daily newspapers. Those who perceived themselves as having stress-related difficulties in their daily life and in their diabetes control, and who were interested in participating in the study were provided with further information about the program and about the design of the study. After a run-in period of 8 weeks, aimed at minimizing the risk of expectation effects upon the variables inherent to the investigation, a group of 36 persons with Type 1 diabetes comprised the study group. Of these 36 persons, 31 (12 men, 19 women) completed the program. The

average age of this final group was 40.8 years (S.D. 12.4) and the mean duration of diabetes 16.7 years (S.D. 10.5).

In order to fulfil the study design, a replicated, interrupted-time-series design [12], two randomized groups was created (termed Group I and Group II). Whereas Group I participated in the program during the spring, Group II acted as a control group and received the intervention during the autumn 6 months later.

Before the start of the intervention period as well as 1 month and 1 year after completion, HbA_{1c} was measured, normal range < 5.3% according to Ellis et al. [13] and subjects filled out the mood adjective checklist (MACL), an instrument designed to measure six different mood domains on a symmetrical, 71-question, four category scale. Lower scores indicate a better mood. The six MACL domains are the following: Hedonic tone (12 items, e.g. happy vs. sad, range of scores 12–48), Extraversion/introversion (11 items, e.g. talkative vs. silent, range 11–44), Positive/negative social orientation (11 items, e.g. cooperative vs. unreasonable, range 11–44), Activation/deactivation (16 items, e.g. active vs. drowsy, range 16–64); Relaxation/tension (10 items, e.g. calm vs. nervous, range 10–40); Control/lack of control (11 items, e.g. self-confident vs. insecure, range 11–44). The MACL has proven to be a reliable and sensitive instrument for measuring both short- and long-term changes in mood [14,15].

2.2. The stress management program

The intervention program employed [16,17], consisted of a 2-h group-session each week for 14 weeks. During this time, participants received instruction in this method, specifically concerning stress and stress management, muscle relaxation techniques, and both mental-imaging and mental goal-setting techniques. In addition to the 14 group-sessions, participants were encouraged to practice these techniques daily at home, both with use of recorded cassette-tapes and without use of the tapes. The tapes and tape-recorders were given to each participant as a gift, as were various books

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