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Is sense of coherence a predictor of lifestyle changes in subjects at risk for type 2 diabetes?

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ABSTRACT

Objective: To determine whether the sense of coherence (SOC) could predict the outcome of an 18-month lifestyle intervention program for subjects at risk of type 2 diabetes.
Methods: Subjects at high risk of type 2 diabetes mellitus were recruited to a low-intensity lifestyle intervention program by their general practitioners. Weight reduction ≥5% and improvement in exercise capacity of ≥10% from baseline to follow-up indicated a clinically significant lifestyle change. SOC was measured using the 13-item SOC questionnaire.
Results: The study involved 213 subjects with a mean body mass index of 37 (SD ± 6). Complete follow-up data were obtained for 131 (62%). Twenty-six participants had clinically significant lifestyle changes. There was a 21% increase in the odds of a clinically significant lifestyle change for each point increase in the baseline SOC score (odds ratio = 1.21; confidence interval = 1.11–1.32). The success rate was 14 times higher in the highest SOC score tertile group compared with the lowest.
Conclusion: High SOC scores were good predictors of successful lifestyle change in subjects at risk of type 2 diabetes. SOC-13 can be used in daily practice to increase clinical awareness on the impact of mastery on the outcome of life-style intervention programs.

Introduction

The prevalence of type 2 diabetes is increasing worldwide. Changes in lifestyle factors such as diet and physical activity are suggested to be the main reasons for this increase.[1] The effective reduction of type 2 diabetes is possible if subjects at high risk make lifestyle modifications,[2,3] although sustained lifestyle change such as that needed to avoid type 2 diabetes may be difficult to achieve.[4] Thus, it is a challenge for subjects at risk to achieve desirable, permanent lifestyle changes. Moreover, it is difficult for clinicians to identify the subjects

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who are most likely to profit from a lifestyle modification program, thereby improving cost-effectiveness. Many studies have found that a positive health outcome can be predicted using the Sense of Coherence (SOC) questionnaire.[5–8] The present study examined whether this simple assessment of the personality trait of mastery can be used as a tool to estimate the likelihood that subjects will achieve successful lifestyle changes.

The salutogenic theory, which focuses on predictors of positive health outcomes, was introduced in the 1970s by Antonovsky, who was interested in stress theory. Based on a study of healthy survivors from concentration camps in the Second World War, he postulated three important properties that allowed them to remain healthy despite their experiences: a) the ability to understand what happens, b) the ability to manage the situation alone or through significant others and c) the ability to find meaning in the situation. According to this theory, the ability to use your own resources is more important than the resources themselves.[9,10] This ability is referred to as the SOC, which can be defined as a way of viewing life or mastery.[9,10] The concept of SOC was shown to have the capacity to predict future health outcomes.[9] Thus, the aim of the present study was to determine whether SOC at baseline could predict the outcomes of a low-intensity lifestyle intervention programme for subjects at risk of type 2 diabetes, and to assess the predictability of other simple demographic factors.

Methods

Subjects and study design

The study sample comprised subjects at high risk of type 2 diabetes mellitus who were referred to the local hospital by their general practitioner (GP). The 'Finnish Diabetes Risk score' was used by GPs to select subjects based on traditional risk factors for type 2 diabetes, such as the body mass index (BMI), waist circumference, inactivity and age.[11] The study operated from March 2004 to September 2005 and there was an 18-month follow-up period. This study was part of a randomized controlled trial, where one group received personal advice and another group received personal advice plus group sessions. There were no important outcome differences between these two treatment groups, as described previously,[12] so the results were combined for all participants for the purpose of this study. Written informed consent was obtained. The details of the recruitment methods, the intervention program and the main results have been published previously.[12] The study was approved by the Regional Committee for Medical Research Ethics of Southern Norway.

Assessments

Body weight and the results of a physical test on a treadmill, using a modified Bruce protocol for subjects in poor physical condition,[13] were determined at baseline and at follow-up. Based on normative data for the maximal aerobic capacity (VO_2 max) with respect to gender and age, the subjects were classified into six levels, i.e., very poor, poor, fair, good, excellent and superior aerobic capacity.[14] A clinically significant lifestyle change was characterized as a weight reduction of $\geq$5% and an improvement in the VO_2 max of $\geq$10% from baseline to follow-up.[12] The health-related quality of life (HRQOL) was assessed at baseline and follow-up using the Medical Outcomes Survey Short Form 36 (SF-36), and the results were used to calculate a physical component summary (PCS) and a mental component summary (MCS). The SF-36 is used internationally as a generic measure of self-reported HRQOL.[15] The scores for PCS and MCS range from 0 (worst possible) to 100 (best possible health state), where the results are standardized to fit a mean score of 50 to the general population.[15,16] Changes in the PCS and MCS scores of 2–5 points are defined as small clinically significant changes, whereas changes of 5–8 and $\geq$8 are defined as moderate and large clinically important changes, respectively.[17] The instrument used to measure mastery at an individual level was the SOC questionnaire. The two most widely used versions of the SOC questionnaire are the original version with 29 items and a shorter version with 13 items.[9] The correlation between SOC-29 and SOC-13 is good ($r = 0.96$)[18], so the short version was used in the present study. According to Antonovsky's three postulated properties, the questionnaire examines three subdimensions: meaningfulness, comprehensibility and manageability.[9,19] SOC-13 was shown to be reliable, valid, feasible and cross-culturally applicable.[9] Subjects were asked to indicate their level of agreement with each of the items on a seven-point scale (1 = never, 7 = always). The total score was summed, which could range from 13 (low SOC) to 91 (high SOC), where a higher score indicated a stronger SOC or mastery. Many studies have shown that the SOC changes with time, but Antonovsky assumed that it would stabilize in early adulthood with marginal subsequent fluctuations.[9,20–22] The aim of the present study was to explore baseline predictors, so SOC was only measured at baseline.

Definition of end points

The primary outcome of this study was to evaluate the objective predictors for a successful, clinically significant lifestyle change, which were defined as weight reduction $\geq$5% and an improvement in the exercise capacity of $\geq$10% from baseline to follow-up.[12]

Statistical analyses

The statistical analyses were performed with the Statistical Package for Social Sciences version 18.0 (SPSS) using descriptive analyses of the baseline characteristics. Clinically significant lifestyle changes, the SF-36 PCS and MCS scores and their changes were computed, as well as the baseline SOC scores. To produce a prognostic model of successful lifestyle change, a multivariable logistic regression analysis was conducted using the combined objective clinically important lifestyle change as the dependent variable with the various demographic and clinical variables, the SF-36 scores and the SOC scores as explanatory variables. To use SOC as an explanatory variable, the results for each single question were analyzed separately, each of the three scores for the subdimensions (meaningfulness, comprehensibility and