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Has brief counselling an impact on the risk factors for cardiovascular disease in 40-year-old men. A three-year follow-up study

Research Article

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Abstract: The metabolic syndrome presents a serious challenge to health professionals. The aim of the present study is to analyze the impact of a brief counselling on cardiovascular risk factors among 40-year-old men. Forty-six males living in north-eastern Helsinki voluntarily completed the follow-up study between 2001 and 2004, and were assessed for clinical risk factors. The mean differences were determined by a paired t-test, and the interaction between groups and time by the F-test with repeated measures ANOVA. After baseline assessment and in 2002, males received a 45 minute nurse-delivered counselling session with self-administered protocol. Cardiovascular risk factors improved significantly ($p<0.05$) from baseline within months. However, the final measurements obtained after three years showed that almost all risk factors, except the low and high density lipoprotein, tended to revert back to baseline. The profiles were similar in all predictor groups. Brief counselling had an impact on risk factors measured in 2002, but only a partial effect on them in 2004. Conclusive results lead to the idea thatmore collaboration is needed between private health care agencies and official primary health care for ensuring the continuity of improved health habits among middle-aged males.

Keywords: *Risk factors • Middle-aged men • Brief counselling • Follow-up study • Collaboration*

1. Introduction

The metabolic syndrome presents a serious challenge to health professionals. It is a global epidemic, which requires urgent preventive action [1]. The metabolic syndrome is characterized by abdominal obesity combined with at least two of the following: an elevated fasting plasma glucose, dyslipidemia, and hypertension [2,3]. In addition to causing type 2 diabetes mellitus [1, 4,5], the metabolic syndrome also increases the risk for cardiovascular diseases [2,5] and predicts mortality [2,6].

Abdominal obesity is particularly typical in men because obese men usually accumulate excess fat in the subcutaneous abdominal area. Epidemiologic studies clearly show that upper-body and visceral obesity increase metabolic risks [5,7].

The critical issue is how to identify the people most at risk and to determine which health education strategies can most effectively change health behaviours, and in this way, pre-empt the onset of disease. The most common methods in use today are various kinds of educational interventions in individual and group settings [8] such as brief intervention where unfavourable life styles are identified and support is given about the risk taking behaviour [9-12]. In generally, brief intervention includes 1 to 5 sessions, and one session takes 5-60 minutes [9,10]. It represents a perspective on responding to health behavioural problems and reasons what counts as a problem [10]. While positive effects of brief alcohol intervention in reducing alcohol consumption [9,11], and

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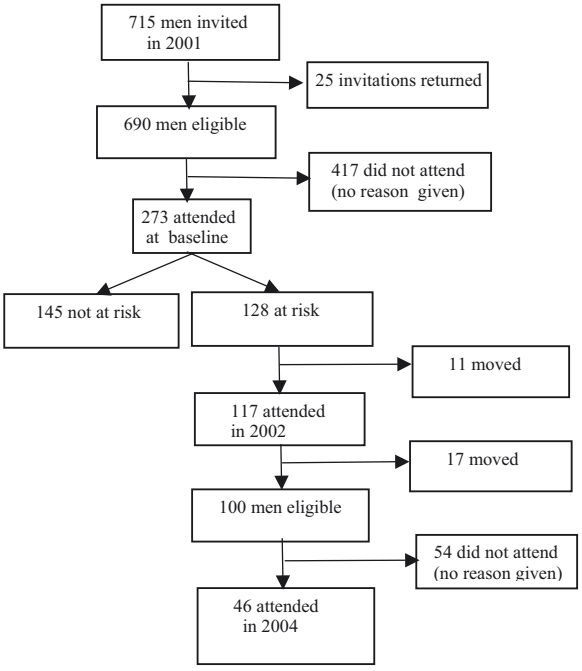
Figure 1. Profile of 3-year-follow-up study.



smoking intervention in increasing cessation in patients with coronary heart disease [12] have been described, little is known about the results of a brief counselling in preventing of cardiovascular diseases as a community-based intervention.

The aim of the present study is to analyze the impact of a brief counselling on the cardiovascular risk factors among 40-year-old men, including the associations with marital status, occupation, and self-rated health.

This follow-up study was a part of a major project focused on the metabolic syndrome among middle-aged men, which was launched in 2001 by the Helsinki Heart District, a member of the Finnish Heart Association, and the City of Helsinki.

2. Material and Methods

2.1. Data collection

Invitations to the study with a request to make an appointment with a public health nurse for clinical measurements at the Helsinki Heart District during Autumn, 2001, and the Health Behaviour Questionnaire (HBQ) [13] were sent out to all men born in 1961 and living in north-eastern Helsinki (n=715). The sample was drawn from the official population register filed by the Statistics Finland Bureau. Twenty-five letters were returned because of unknown addresses. After two reminders were sent out, the final sample composed of 273 (39.6%) men, who voluntarily completed the questionnaire and attended health examinations with public health nurses. Written consent was obtained from each participant, and no participation fee was offered.

Data for this study were collected at three points in time: At baseline in 2001, in 2002 and in 2004. (Figure 1).

2.2. Measurements and brief counselling

The HBQ, designed by the National Public Health Institute [13], includes questions regarding socio-demographic factors, subjective health status, chronic diseases, health care visits and lifestyle factors. It contains 96 items, of which the variables of marital status, occupation, and self-rated health were used in this study.

During the initial meeting with the subjects, two public health nurses at Helsinki Heart District, administered the blood tests (cholesterol), and obtained health measurements [body mass index (BMI), waist circumference (WC) and systolic and diastolic blood pressure (SBP, DBP)].

Measurements were taken from each subject, these numerical values determined whether the male subjects were at risk for cardiovascular disease. Nurses measured the high-density lipoprotein (HDL) levels, low-density lipoprotein (LDL) levels, triglycerides (TG), and blood glucose (fBGluc) [14,15].

Nearly one-half of the males (46.9%; n=128) were considered at risk for cardiovascular disease. These males were selected to take part in a follow-up study, and they were given recommendations and advice on how to maintain healthy habits and lifestyle regimes.

The main goal of this *brief counselling* was to increase the male concern for maintenance of healthy living regimes and educate them about possible risks (like high cholesterol or elevated blood pressure) by providing accurate information and healthy nutrition habits combined with physical activity.

A public health nurse gave a 45 minute counselling session and provided a written advice brochure for informative purposes. The counselling was based on a self-administered protocol, following current guidelines [14,15]. First, she explained the results of the health examinations and their relevance to the participant's health. The male subjects were encouraged to ask questions in order to clear up any concerns they may have had regarding their health issues. Misunderstandings were corrected according to current findings in the literature. The public health nurse guided the subjects in setting desired health goals and advised them in finding the best ways to cope with their risks for cardiovascular disease. After 1-3 weeks, when laboratory results were ready, the nurse informed males

Table 1. Risk factors at baseline in 2001 and in 2004 (n=46).

Risk factor	Criteria	2001	2004	t	df	p-value
		%	%			
WC (cm)	≥100	47.8	50.0			
Mean (SD)		99.3 (9.4)	98.8 (5.08)	.725	45	.472
BMI (kg/m^2)	25.0-29.9	65.2	55.7			
	≥30.0	19.6	26.5			
Mean (SD)		27.4 (3.2)	27.5 (2.11)	.564	44	.575
DBP (mmHg)	≥90	63.0	54.3			
Mean (SD)		92 (10.0)	88 (1.07)	2.64	45	.011
SBP (mmHg)	≥140	56.5	34.8			
Mean (SD)		139 (18.2)	134 (16.8)	1.86	45	.069
HDL (mmol/l)	<1.0	17.4	10.9			
Mean (SD)		1.3 (0.4)	1.4 (0.4)	2.29	45	.027
LDL (mmol/l)	≥3.0	89.1	62.2			
Mean (SD)		3.9 (0.9)	3.3 (0.9)	4.78	44	.001
TG (mmol/l)	≥1.7	19.6	17.4			
Mean (SD)		1.6 (0.9)	1.5 (0.8)	1.25	45	.215
fBGluc (mmol/l)	≥5.3	54.3	52.2			
Mean (SD)		5.3 (0.5)	5.5 (0.5)	2.56	45	.014

by phone, and confirmed previous counselling.

In 2002, 11 men had moved, and measurements were obtained from 117 males (Figure 1). The assessment of the findings and health counselling were implemented again, of which counselling lasted for 45 minutes, in average. The location for counselling and the public health nurse responsible for the counselling session remained the same.

Between 2002 and 2004, 17 more men had moved (Figure 1). After one re-invitation, 46 of the remaining 100 men participated in the final clinical measurements that were carried out by public health nurses employed by the City of Helsinki Health Centre, at the men's "own" community health station. Blood examinations were taken in the laboratory before meeting the nurses. During these sessions, the results were given to the males. However, men had the option of continuing discussions with health professionals during their normal health center visits, because the results were attached to the participant's medical records with their consent.

2.3. Statistical analysis

The outcome variables used in this study were WC, BMI, DBP, SBP, HDL, LDL, TG, and fBGluc. The risk criteria [14,15] are presented in Table 1.

Marital status and occupation were dichotomized (married, not-married; industrial, clerical). Also self-rated health was dichotomized into two groups: good health (excellent and good) and average/poor (average, poor, and very poor). Average health was combined with poor health on the basis of the extant medical literature [16-18].

Percentages and paired t-tests were used to compare baseline and final measurements. Repeated measures analysis of variance (ANOVA) was conducted using a general linear model [19-21]. Normality of variables was verified using the Wilk-Shapiro test.

Variances were tested by Mauchly´s test. Depending on whether the outcomes were statistically significant ($p \leq .05$), we used the Huynh-Feldt Epsilon correction. We analysed interactions between time and groups with repeated measures, using F tests. A p-value of 0.05 was considered statistically significant. All analyses were done using SPSS, version 11.0.

2.4. Ethical issues

This study was a part of a larger study supported by Helsinki Heart District and City of Helsinki Health Centre, which had the ethical approval from the Coordinating Ethics Committee of Hospital District of Helsinki in 2001. All subjects participated voluntarily and were informed both in writing and through verbal communication regarding the goals and content of the Metabolic Syndrome Project and were aware that they were free to withdraw at any time. Monetary incentives were not offered to increase a response rate. The results of the health examinations were attached to the participant's medical records with their consent.

Table 2. The means of risk factors according to marital status, occupation and self-rated health (N=46).

Predictor (n)		WC (cm)	BMI (kg/m²)	SBP (mmHg)	DBP (mmHg)	HDL (mmol/l)	LDL (mmol/l)	TG (mmol/l)	fBGluc (mmol/l)
Marital status									
Married (35)	1	98.9	27.1	141	92	1.3	3.9	1.6	5.3
	2	96.8	26.4	130	87	1.4	3.6	1.3	5.1
	3	97.6	27.0	134	87	1.5	3.3	1.5	5.5
Not married (11)	1	100.6	28.1	132	90	1.2	3.7	1.6	5.4
	2	100.2	27.9	131	86	1.2	3.6	1.4	5.2
	3	102.5	29.0	136	90	1.2	3.3	1.5	5.6
Interaction	F	1.35	1.99	2.11	1.64	1.78	.366	1.47	1.11
	p	.262	.117	.087	.199	.174	.695	.857	.355
Occupation									
Industrial (19)	1	99.7	27.5	143	89	1.4	3.7	1.7	5.4
	2	98.5	26.8	131	87	1.4	3.7	1.3	5.4
	3	99.6	28.0	133	88	1.5	3.3	1.6	5.7
Clerical (27)	1	98.7	27.1	136	93	1.3	4.0	1.6	5.3
	2	96.7	26.7	129	86	1.3	3.5	1.3	5.0
	3	97.8	27.1	135	88	1.3	3.2	1.4	5.4
Interaction	F	.260	1.99	2.66	1.60	.925	2.69	.452	1.34
	p	.733	.117	.105	.207	.400	.074	.630	.875
Self-rated health									
Good (28)	1	98.3	26.9	138	90	1.3	3.9	1.5	5.1
	2	96.1	26.3	129	83	1.4	3.5	1.3	5.0
	3	98.0	27.1	136	87	1.4	3.2	1.5	5.3
Average (18)	1	100.9	28.0	141	94	1.3	3.9	1.8	5.6
	2	100.1	27.5	132	91	1.3	3.8	1.3	5.7
	3	99.8	28.0	132	88	1.4	3.3	1.5	5.7
Interaction	F	2.71	.322	2.92	1.82	1.12	.351	3.68	.342
	p	.045	.820	.026	.135	.349	.843	.008	.849

1=baseline measurement in 2001, 2= in 2002, 3= in 2004.
Interaction between time and group: F, p-value, df - values: marital status (2-4, 86-88), occupation (2-6, 82-88) and self-rated health (2-4, 82-86)

3. Results

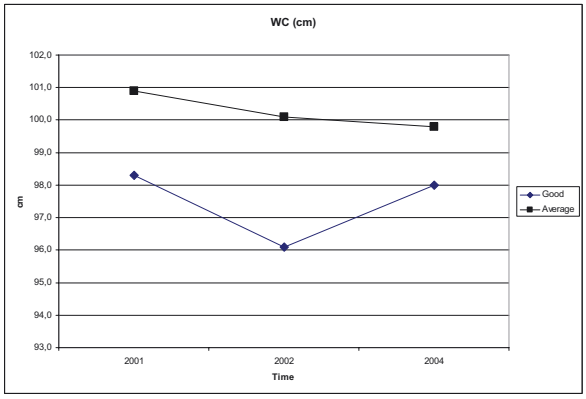
3.1. Clinical measures

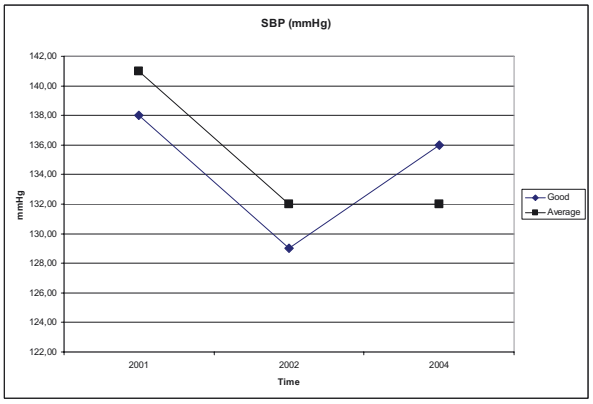
Table 1 shows the results of the paired t-test at baseline in 2001 and in 2004. The means of the DBP (t = 2.64, p ≤ .011), HDL (t=2.29, p ≤ 0.027), and LDL (t = 4.78, p ≤ .001) decreased significantly during the follow-up. Percentage distributions and the means of the risk factors showed no stable positive changes from baseline to the final measurement with respect to WC, BMI, and glucose readings. On the contrary, BMI increased and glucose levels were significantly higher (t = 2.56, p ≤ .014) in the final measurements as compared to baseline measurements.

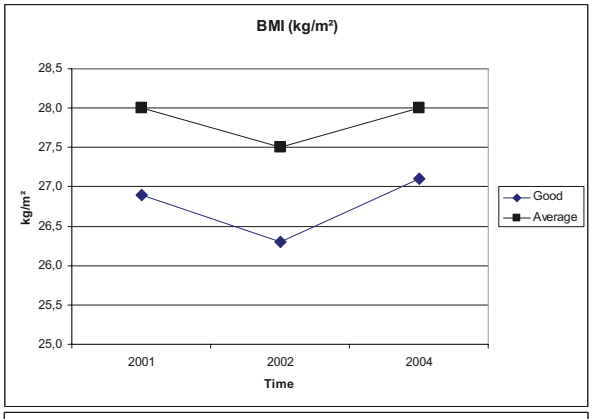
Table 2 presents the mean value for the risk factors for cardiovascular diseases and the time interactions between the predictor groups in 2001, 2002 and 2004. The mean risk factor values were similar in all predictor groups. Most of the changes in 2004 tended to revert toward baseline values following an improvement in the first follow-up measurement. The significant interaction between time and self-rated health involved WC (p ≤.045), SBP (p ≤ .026), and TG (≤.008).

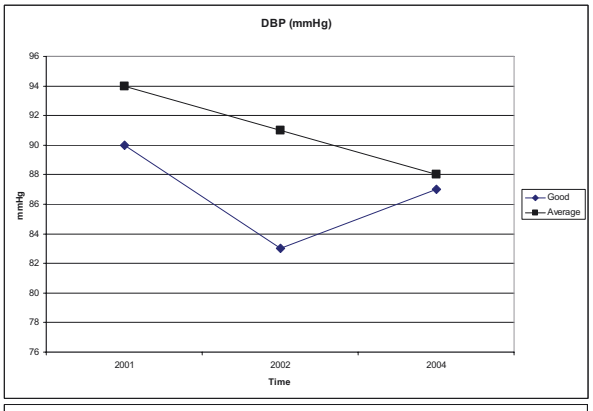
Figure 2 illustrates the profiles of the mean values for the cardiovascular risk factors in the self-rated health group.

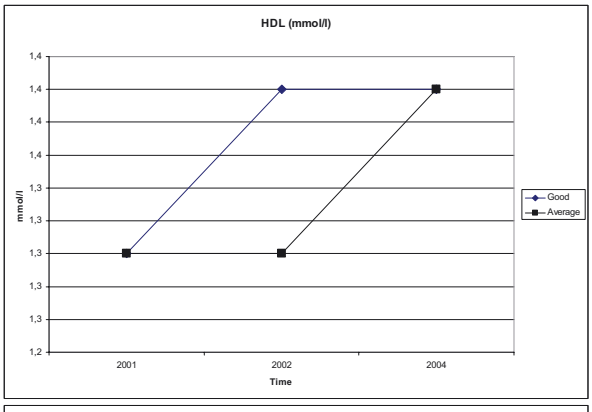
Figure 2. Risk factors in the groups of self-rated health.

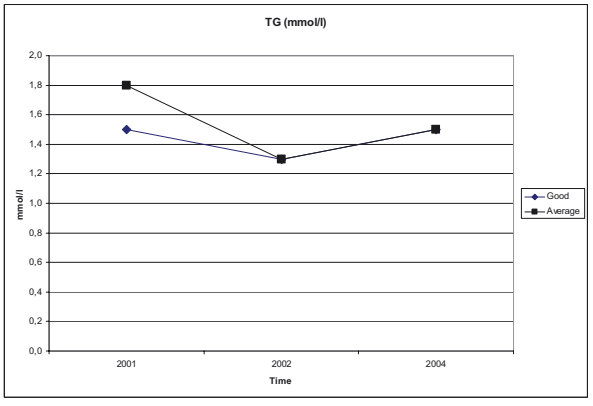


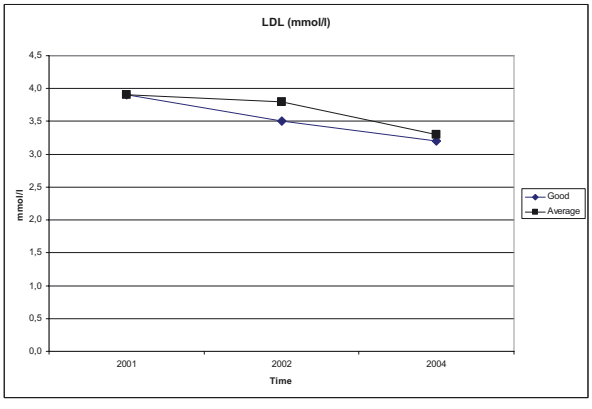


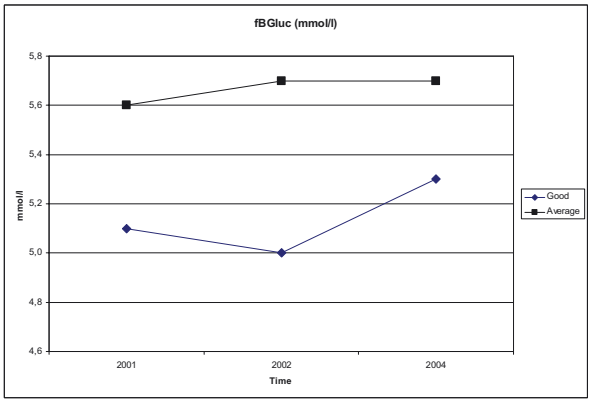












4. Discussion

4.1. Follow-up

The results during the first follow-up showed an improvement compared to the baseline values. However, the final measurements showed that almost all risk factors, except LDL and HDL, tended to revert back to baseline. Statistically significant negative reversions were seen for BMI and glucose values in all three predictor groups. The only difference was evident with respect to self-rated health; more attention is therefore needed in the future among men, who rate their health as average or poor [16].

Half of the men had a serious risk for abdominal obesity (WC ≥100 cm). The results are consistent with previous findings that visceral obesity appears to be a key component and might cause metabolic syndrome over the years [5,7,22].

Judging by these findings, most of the men appeared to be in the preparation or action phases while changing their health habits [23-25] but remaining ambivalent, because most of the changes in the final measurement of the risk factors tended to revert toward baseline values. This result may be due to low statistical power, but it is possible that the lack of effect was due to the relatively brief nature of the counselling given, or to the fact that no follow up support after first follow-up was offered. It appeared that the critical point for health behaviour maintenance was the follow-up in 2002. Behavioural strategies are based in part on the fact that 'a bad health habit' is a learned behaviour, and their aim is to identify and change factors that are associated with it [8]. The mismatch between a person's needs and the interventions may be a major cause for resistance to new health habits [8,25-27]. Males may need stronger support and individually tailored interventions at the stage, where the first positive changes appear.

4.2. Study limitations

There were a number of limitations in this study. Firstly, there was a low response rate from subjects who were contacted to take part in the study. We, therefore, drew a sample of 28 non-respondents, and employed a focused interview in order to gain an understanding of the reasons for non-participation. The results indicated that males were asymptomatic, had no time to take part in the study, or were not interested in the project (Näslindh-Ylispangar et al. [28]). In the case of males, gender may, however, provide an additional explanation for non-responsiveness [29]. A growing body of research suggests that males are less likely than females to seek help from health professionals for problems as diverse as depression, substance abuse, physical disabilities, and stressful life events [30-32]. The avoidance of health care might also be a form of social action that allows some men to maintain their status and to avoid being relegated to a subordinated position in relation to physicians and health professionals, as well as other males [31].

Secondly, except the low response rate, the drop-out of males after the first follow-up reduced the final number of the participants. An important, but unknown reason for this may be the change of the location of the measurements at the final follow-up; rather than going to the Helsinki Heart District facilities as they did in 2001 and 2002, the men were permitted to visit their local community health station. A fear of being labelled as unhealthy or disabled has been found to be a major deterrent, especially for men [27,33-34].

Thirdly, a short-term counselling was not sufficient to produce stable results for all risk factors. A longer time period of regular encounters is needed to motivate males for better health habits. That might hinder a reversion of risk values.

In spite of these weaknesses, strength of the current study was that follow-up was long enough to show the influence of time. If the follow-up period was < 1 year, the study period should be considered too short a period of time [35].

4.3. Conclusions and recommendations

There is a clear need for more research on community-based health counselling in the male population. For this research study, brief counselling had an impact on risk factors measured during first follow-up in 2002, but only partial effect on them at the final follow-up in 2004. The results highlight the importance of developing better behavioural skills that can prevent the resumption of unhealthy behaviours in 40-year-old men. Each encounter needs to be tailored to one's motivational readiness to change.

Although, our study was a community-based project, where screening for risk factors for cardiovascular diseases and subsequent brief counselling was not incorporated into routine practice in health centres, it would easily be transferred into normal consultations in primary health care. It is critically important for nurses and physicians to pay attention to an accessibility of health services and to take males into account as they talk about issues of health promotion. Additionally, more collaboration is needed between private health care agencies and official primary health care for ensuring the continuity of improved health habits among middle-aged males.

The low participation should alert policy-makers and health care professionals to seek means to arouse middle aged men into taking an active interest in their own health and well-being.

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