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Original Article

Reducing weight in an internal medicine outpatient clinic using a lifestyle medicine approach: A proof of concept☆

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ABSTRACT

Background: Chronic non-communicable diseases represent the major drivers of disease burden, being responsible for the majority of health care cost and deaths. Almost half of premature deaths is due to behaviors amenable to change. Accordingly, addressing behavior might represent a strategic change in the health delivery system. Improving lifestyle requires a specific strategy embedding the active collaboration of individuals with a multilevel team-oriented medical practice. With the present study we sought to assess whether the implementation of cognitive-behavioral strategies, following the principles of lifestyle medicine in an outpatient clinic provides better results in weight reduction as compared to simpler strategies as presently executed in General Practitioners' offices.

Methods: This is an observational study on 173 subjects (age 53.1 ± 11.5), comparing three different groups of preventive practice: a personalized lifestyle medicine, combining cognitive behavioral strategies with patient tailored prescription of exercise and nutrition (Group A); a semi-structured approach with generic counseling (Group B); and an unstructured advice (Group C).

Results: At the end of the intervention period (17–20 months), group A showed an average weight loss of 5.4 ± 5.1 kg, which was significantly ($p < 0.001$)more than observed in group B (2.8 ± 5.1 kg) and group C (1.2 ± 4.8 kg). Likewise BMI and waist were progressively more reduced from A to C.

Conclusions: It is possible to implement preventive cognitive-behavioral lifestyle strategies in outpatient internal medicine clinics. This methodology appears more efficacious in inducing weight reduction after more than a year as compared to usual family medicine approaches.

1. Introduction

Chronic non communicable diseases have become one of the major drivers of disease burden, being responsible for 75% of total health care costs and the majority of deaths in the US [1]. The rising prevalence of life style related risk factors such as obesity-diabetes and sedentariness together with their tight link with traditional risk factors such as lipids or hypertension, calls for novel strategies capable to explicitly empower patients to their health [2,3]. A relevant recent study points out that given that chronic diseases represent the leading cause of death in the US, 40% of all premature death is due to behaviors amenable to change [4]. Accordingly addressing behavior might represent a strategic change in the health delivery system. However the present health care, based on a model aimed at treating diseases once developed by the dyad patient–physician is evidently insufficient to the task. Reengineering [4] health delivery, considering multiple domains and specialties, in a team based system might be what is necessary to revert the present trend to a future of increasing health, particularly at an old age, as advocated by almost all scientific statements and guidelines [3,5]. What really matters, in fact, is not only knowledge and instruments, but rather the effective application of therapies, be it drugs or behavior, capable of inducing change in relevant outcomes [2,6,7].

To implement this portended change improvements in individuals' life style appear mandatory [2]. Clinical work should be guided not by simple advice, but by precise prescription and negotiated goals within a specialized framework of environmental and personal resources [8,9]. Our policies should build on the overwhelming evidence that improving life style reduces disease burden and improves survival [3–5,8,10–12]. The attendant need for innovation is also well recognized, although the complexity and difficulty of defining successful strategies for meaningful and lasting improvements in lifestyle habits at the individual level still require extensive investigations [13]. In particular it is unclear how and to what extent the present health system can accommodate the specific goals of personalizing lifestyle treatment for long

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periods of time, at a sustainable organizational and economic cost [4,14].

In this context, over the last few years we developed IT based life style assessments [15,16], tested the feasibility of introducing lifestyle modification at the worksite [17], and showed the superiority of ecological, multidimensional individualized approaches [18], embedding elements of cognitive-behavioral changes in an internal medicine paradigm.

With the present study we sought to assess whether the implementation of cognitive-behavioral strategies [19] in an outpatient internal medicine clinic provides better results in weight reduction as compared to simpler strategies as presently executed in General Practitioners' offices.

2. Methods

This observational study involves 173 subjects (age 53.1 ± 11.5 see Table 1), who sought medical advice in order to reduce cardiometabolic risk profile.

We enrolled subjects that were free from acute disease, excluding patients already following programs to lose weight at the moment of the enrolment, or taking pharmacological therapy for obesity. We also excluded patients affected by ischaemic heart disease, heart failure, chronic kidney disease, cancer, psychiatric disorders, alcohol or drugs abuse. Overall participants presented one or more cardiometabolic risk factors, such as overweight–obesity–dyslipidemia, increased values of systolic/diastolic arterial pressure, increased value of fasting plasma glucose, or smoking (14.37%). Stress was not considered in the present study. Medical treatment of participating patients (whether for dyslipidaemia, hypertension or diabetes) was not modified along the study period.

Given the importance attributed to the specific strategies of life style interventions employed to reduce cardiometabolic risk, we enrolled consecutive patients from three different outpatient services, implementing three different therapeutic modalities (personalized cognitive behavioral approach, as in lifestyle medicine [8,20]—group A; semi-structured approach, following local guidelines for family physicians [21]—group B; usual approach, without specific guidelines—group C, as schematically depicted in Fig. 1, and detailed in the Online Supplementary Material).

Table 1
Study population.

Variables	Units	N	Means ± SD
Age	years	173	53.1 ± 11.5
Gender	F	86	
	M	87	
Height	cm	173	167.7 ± 9.6
Weight	kg	173	86.3 ± 14.2
BMI	kg/m^2	173	30.6 ± 4.1
Waist	cm	155	103.0 ± 9.8
HR	bpm	120	71.1 ± 8.8
SAP	mm Hg	168	134.1 ± 14.5
DAP	mm Hg	168	83.1 ± 8.7
FPG	mg/dl	154	106.7 ± 29.2
TC	mg/dl	168	213.3 ± 38.7
HDL C	mg/dl	160	52.8 ± 12.6
LDL C	mg/dl	160	131.2 ± 36.0
TG	mg/dl	165	149.9 ± 83.8
ALT	UI/l	110	24.9 ± 15.2
AST	UI/l	123	35.8 ± 36.4
GGT	UI/l	90	38.1 ± 35.3
Dyslipidemia	%	4.6	
Diabetes mellitus	%	6.9	
Hypertension	%	52.9	

Abbreviations: BMI = body mass index; HR = heart rate; SAP = systolic arterial pressure; DAP = diastolic arterial pressure; FPG = fasting plasma glucose; TC = total cholesterol; HDL C = HDL cholesterol; LDL C = LDL cholesterol; TG = triglycerides; ALT = alanine transaminase; AST aspartate aminotransferase; GGT = gamma-glutamyl transpeptidase.

All subjects underwent clinical assessment (history, standard medical examination, anthropometric and hemodynamic data) and blood tests (fasting plasma glucose, total, HDL and LDL cholesterol, triglycerides, blood count), ALT (alanine transaminase) and AST (aspartate transaminase) levels at the beginning and end of the study.

The protocol of this study fully adheres to the Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects, as Adopted by the 18th WMA General Assembly, Helsinki, Finland, June 1964 and subsequent amendments.

All subjects were instructed about the study procedure and gave their informed consent. Our institution ethics committee approved the use of anonymized clinical data for this study.

2.1. Statistics

Data are presented as mean ± SD. Significance of differences was assessed with 2 way repeated measures ANOVA and 1 way ANOVA (GLM) followed by individual contrasts (LSD). Missing data were not imputed. Significance level was set at $p < 0.05$. Computations were performed using a commercial statistical package (IBM SPSS, version 22).

3. Results

Details about overall study population are presented in Table 1, which also shows that a limited fraction of the population reported chronic stable conditions, such as dyslipidemia, diabetes or hypertension. Table 2 provides separate data for the three different groups, both before and after the intervention. It is apparent that the group A, which underwent a lifestyle medicine cognitive behavioral intervention, seems to have obtained the greatest weight reduction as compared to either group B (structured intervention) or C (advice as intervention) (see Fig. 2). Likewise similar trends of greater efficacy were observed in reducing BMI or WC.

Small reductions in systolic arterial pressures were observed in all three groups, with no interaction (Table 2). Small changes were observed in lipid profile, probably of no real biological impact.

4. Discussion

This study provides two major findings:

First we demonstrate the feasibility of implementing a lifestyle medicine intervention [8,20] based on cognitive-behavioral strategies [3,22–25] and personalized prescription of nutrition and exercise programs [3,9,26–29] in an outpatient internal medicine clinic. Second we demonstrate the superiority of this approach in obtaining sizable weight reduction over a reasonably long period of time.

The widespread impact of overweight-obesity, and the diffuse lack of exercise within the general population, combined with poor eating habits call for generalized interventions [2,3,11,30]. Addressing separately (involving different specialists) every component of cardiometabolic risk would burn a large fraction of available resources without guaranteeing satisfactory results, unduly straining the health delivery system [4]. A simple, nearly simplistic, way to approach poor lifestyle is to advise people of the advantage of reducing weight (and BMI and even more waist circumference), or follow common sense [19,20,31–33]. Advice alone however is not very effective at improving behaviors such as healthy diet or sufficient exercise [30,34,35].

In addition, healthy lifestyle represents an important adjunct to drug based therapy in secondary prevention of several chronic conditions, such as with cardiometabolic and oncologic diseases [36]. Moreover patients undergoing treatment for high cardio-metabolic (or oncologic) risk might terminate it or shift to poor adherence, with resulting loss of benefit [7].

The effects of advice could be reinforced by the use of simple educational tools, like focused leaflets explaining the risks of obesity, and the