

THE ROLE OF LIFESTYLE INTERVENTION ON BLOOD PRESSURE REDUCTION: ITS IMPACT ON CORONARY HEART DISEASE

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Abstract : Epidemiological studies indicate that the risk of Coronary Heart Disease (CHD) increases continuously with increasing blood pressure. Several factors have been identified, not as independent cardiovascular risk factors, but as factors, which have been shown to increase blood pressure; such as excess weight, alcohol and sodium intake and smoking. A total of 100 patients aged less than 65 years were interrogated. Statistical analysis: Data was entered in SPSS software version 12 to get blood pressure recordings associated with the CHD patients at 95% confidence interval of the difference and paired t-test. All severely ill patients, patients aged more than 65 years were excluded. Lifestyle modification interventions included exercises, weight reduction decreased, alcohol consumption, and dietary modification. Smoking cessation, stress management were assessed; intake of antioxidants and fish oil supplements, was also noted. Patients in lifestyle intervention group significantly reduced the intake of saturated fat, sugar and cholesterol ($p < 0.001$), increased their exercises ($p < 0.01$) and stopped smoking ($p < 0.05$) when compared with the usual care group. This study demonstrated that modification of lifestyle in CHD patients can reduce risk factors of CHD and blood pressure, and prevent second heart attack.

Key words: Lifestyle, coronary heart disease, and modification

INTRODUCTION

Coronary heart disease (CHD) is the single most important cause of death and, more importantly, the single biggest cause of premature death in modern, industrialized countries. In addition, it is an increasing cause of death in developing countries. The CHD mortality rates in 1994 for men and women in 32 countries were studied; there is clearly a wide variation in these rates, the highest being found in Eastern Europe, Northern Ireland and Scotland and the lowest rate in Spain, France and Japan; mortality rates are generally much higher for men; this distinction is present at all ages but is less after the menopause in women¹. Epidemiological surveys indicate that the risk of coronary heart disease increases continuously with increasing blood pressure, the higher the individual's blood pressure, highest the risk, the lower the blood pressure the lower the risk². Blood pressure levels vary in different populations and by social class. There are racial differences in the occurrence of hypertension; for sample, Black Africans who live in westernized societies have higher blood pressure and more strokes than their caucain counterparts. An example of the cultural differences that occur is seen in Africa with Black Africans who have moved to westernized cities having higher blood pressure than Black Africans who continue to live in a rural setting. Blood pressure rises, as people grow old in westernized societies, but again not in rural, undeveloped ones. Finally, there is genetic component - hypertensive families³. A systematic review identifying 30 trials found that in people over the age of 44, reduction of 100 m mol sodium reduced systolic blood pressure by 6 mmHg. Although this magnitude of change requires a substantial alteration in diet with intensive intervention⁴. A recent trial of the dietary approach to stop confirms that intensive multiple lifestyle interventions can reduce blood pressure by 5 mmHg⁵. Systematic reviews support increasing dietary potassium⁵, reducing weight⁶⁻⁷ and increasing exercise⁸. A large cohort study found that eating fruits and vegetables reduces the risk of ischemic stroke⁹. There is mixed evidence that increasing the intake of fiber, fruit and vegetables lowers blood pressure⁴. However,

most of the studies addressing the efficacy of intervention have been carried out either in hypertensive patients in life style tightly controlled secondary care settings, or in general population groups^{11, 12}.

MATERIAL AND METHODS

The study was carried out in Shahid Madani Heart Hospital in CCU ward, Cardiology department in Tabriz University of Medical Sciences during 2003-2004. Objective of this study was to assess effectiveness of lifestyle modification in reducing of blood pressure in coronary heart disease patients. The patients were divided into two groups, 50 patients in intervention group and 50 patients in control group; and assessed by questionnaire prepared for assessment of lifestyle and risk factors of CHD patients as per guidelines laid down by the center for disease control¹⁴. The behavioral risk factor survey questionnaire concentrates on behavior and addresses risk factors for CHD patients; cardiologist determined the validity of questionnaire. A test-retest reliability study (n=100) using the instrument in 20 patients, showed reliability coefficients of 0.06 or greater for all risk factor variables reported here.

Exclusion Criteria: All the severely ill patients, patients aged more than 65 years, all patients from out side of Tabriz Sampling: formula for calculation of sample size for studies commonly pursued in Medical Research as follow:

Statistical Analysis: Studies using the student t-test randomized controlled trials with one experimental group and one control group) and considering alpha error only.

$$N = \frac{(Z\alpha)^2 \times 2 \times (S)^2}{(d)^2}$$

$Z\alpha$ = value for alpha error, S^2 = Variance, d = difference to be detected
 N = sample size

The sample size on the basis of blood pressure recording was chosen. Thus by rounding of number a total of 100 patients was included in this study. To collect the information on various aspects, focusing the objectives of the study, were analysed. The data collected through the questionnaire, clinical assessment and investigation were entered in the computer before and after education in both intervention and control groups, using SPSS software version 12 carried out analysis.

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First frequency distributions of patients according to socio-demographic, history of present illness, past history and general physical examination, lifestyle assessment, were tabulated.

RESULTS

The analysis showed that fruit and vegetable consumption was slightly higher than expected, better-educated patients were more likely to have better knowledge regarding both blood pressure and cholesterol and knowledge level was generally higher after intervention for blood pressure than cholesterol, level of education was associated with risk factors after adjusting for age, sex. The college graduates were able to state their own blood pressure and to know that 140/90 mmHg or less is a good blood pressure thus were more than three times knowledge able than patients who had not completed high school; college graduates also had higher odds of engaging in regular aerobic exercise and lower odds of being obese; educational level also affected the body mass index(BMI), the interaction between sex and education was significant ($p < 0.01$); those with BMI 25.9 kgr/m² in lifestyle intervention group reduced the intake of saturated fat, sugar and high diet cholesterol ($p < 0.001$), increased their exercise level after education ($p=0.01$) and stopped smoking ($p < 0.05$) when compared with control group; 95% confidence interval was significant.

DISCUSSION

The main finding of this study was that education and modification of lifestyle of patients with intervention package were independently associated with behavioral risk factors for cardio vascular disease and reducing of blood pressure; smoking; lack of regular exercise, and obesity, as well as knowledge about blood pressure, were significant. In order to study the effect of risk factor modification by means of NIL pharmacological interventions in patients suffering from CHD, we scrutinized every risk factor separately. Each factor was amenable to modification through interventions, aimed at behavior change. Behavior oriented interventions, incorporating cognitive and behavioral factor smoking cessation techniques, showed positive results in reducing smoking rates in MI patients¹⁵. Elevated serum cholesterol concentrations were reduced by intensive dietary modification. Thus, major changes on dietary habits can be achieved in CHD patients, and this may even lead to stabilization or regression of coronary atherosclerosis. Several studies indicated that physical exercise may prevent progression of atherosclerosis as well. Secondary prevention programs aimed at increasing physical exercise can bring about reduced cardiovascular mortality and morbidity, although unambiguous evidence concerning these effects is still lacking. Thus, to be maximally effective, risk management should focus on selection of patients most likely to benefit from particular program, or even better, patients should be referred to the treatment that is most appropriate for their needs. This is in accordance with recent general guidelines for cardiac rehabilitation as formulated by WHO and later Great Britain, the Netherlands and other European

countries; these emphasize determination of the patients needs and individual sub goals for rehabilitation in theory, the most suitable type of cardiac rehabilitation, should be chosen, but in actual practice the needs of individual patients are still barely taken into account. To optimize the effects of cardiac rehabilitation, every patients should be screened to determine which risk factors contribute to his or her condition, after which the most suitable cardiac rehabilitation program should be applied. Very likely this approach will improve the patients motivation, which could have a favorable influence on the effects of the intervention. It was shown that exceptionally motivated patients make comprehensive lifestyle changes that lead to improved cardiovascular status. To reach the majority of patients better applicable, although effective behavioral interventions should be developed. In particular the motivation to sustain favorable effects, should be enforced, with more intensive changes; whatever the patient decides, the cardiologist should support this decision and explain the relative risks, benefits, costs, and side effect of each secondary prevention approach, be it invasive or noninvasive, pharmacological, or non pharmacological.

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REFERENCES

1. Uemura K, Pisa z 1988 Trends in cardiovascular disease mortality in industrialized countries since 1950, world health organization statistics, Quarterly 41:155-178.
2. MacMahon S, Peto R, Cutler J et al 1990. Blood pressure, stroke and coronary heart disease, part I. Prolonged difference in blood pressure prospective observational studies corrected for the regression dilution bias, Lancet 335:765-774.
3. Bulpitt C (ed) 1985 Handbook of hypertension volume 6: epidemiology of hypertension, Elsevier Science Publishers, Ams Terdan.
4. Fodor G, Whitmore B, Lermen F, Larochelle P. Recommendations on dietary salt, (MAJ 1999; 160(suppl9): 29-34.
5. Cappuccio FP, MacGregor GA. Dose potassium supplementation lowers blood pressure? A meta-analysis of publisher trials. J Hypertens 1991; 9:465-73.
6. Mulrow CD, Chiquette E, angel L, Cornell J, Summerbell C, Anagnostelias B, et al. Dieting to reduce body weight for controlling hypertension in adults. Cochrane database cyst Rev 2000;(2): CD000484, (Gen Bank).
7. MacMahon S, culter J, Brittain E, Higgins M. Obesity and hypertension: epidemiological and clinical issues. Euro Heart J 1987;8(suppl 13): 57-70. (ISI) (Medline).
8. Halbert J, Silagy C, finucdmP, Withers R, Handorf P. the effectiveness of exercise training in lowering blood pressure; a meta-analysis of randomized controlled trials of 4 weeks or longer. J Hum Hypertens 2003; 11:641-9.
9. Joshipura K, Ascheris A, Manson J. Fruit and vegetable intake in relation to ischaemic stroke. JAMA 1999; 282:1233-9.
10. Steptoe A, Perkins – Porras L, McKay C, Rinki E, Hiltons cappuccio F Behavioral counseling to increase consumption of first and vegetable in low income adults: randomized trial BMJ 2003; 328:855 (Cross ref).
11. John J, Ziebland S, Yudkin P, Roel, Neil H. Effects of fruit and vegetable consumption on plasma antioxidant concentrations and blood pressure: a randomized controlled trial. Lancet 2002; 359:1969-74. (Cross Ref) (151) (Medline).
12. Remington PL, Smith M, Williamson DF, et al. Design, characteristics and usefulness of state-based behavioral risk factor surveillance. 1981-1986. Public Health Rep 1988;103; 366-75.
13. US Department of Health and Human Services. The 1988 report of the joint national committee on detection. Evaluation and treatment of high blood pressure. Arch intern Med 1988; 148:1023-38.
14. Rose GA, Blackburn H, Gillum RF, Prineas RJ. Cardiovascular survey methods (second edition) World Health Organization General 1982; 144-172.
15. Laylor CB, Huston Miller N, Killon HD, et al. Smoking cessation after acute myocardial infarction effect of a nurse managed intervention. Ann Intern Med 1990; 113:118-23.

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