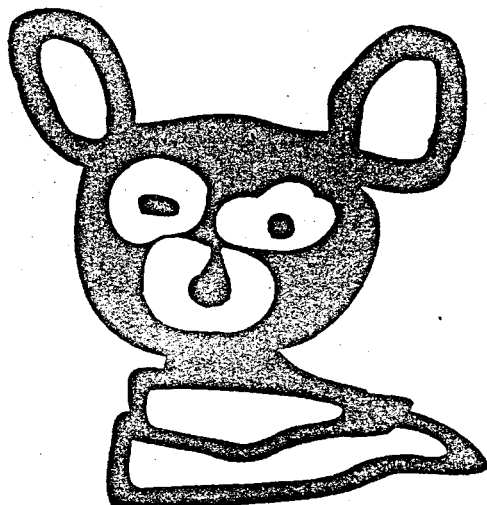


CURRENT TRENDS OF THE
PREVENTION OF ATHEROSCLEROSIS
IN CHILDHOOD 2.



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PREVENTIVE PROGRAM "MY HEART, HEALTHY HEART" IN PRESCHOOLCHILDREN IN SUBOTICA

Abstract

In our region, due to cardiovascular diseases (CVD) take the first place in the structure of the general mortality (60%) and second (19%) in the general morbidity, with high frequency of risk factors in children and adult population, unbalanced family and social nutrition and incorrect life style.

Therefore, the early discovery of atherosclerosis risk factors and the undertaking of prompt preventive measures in early childhood are necessary, in order to reduce the risk factors, morbidity and mortality caused by CVD.

The purpose of this preventive program ("My heart, healthy heart") has been to change current diet, evaluate nutrient adequacy of social nutrition and identify children with some risk factors or with positive family history.

This program includes training of food service personnel, modified menu recipes and food preparation methods, constant nutrition education, physical activity and growth monitoring of children, identification of children with obesity hypertension and positive family history for selective screening of lipid parameters.

Analysing preschoolers (2422) in Subotica with some risk factors we found with obesity 15,27% girls and boys (body weight over P97), significant hypertension 4,40% (systolic blood pressure P95-99) and severe hypertension 4,30% boys and 3,16% girl (systolic blood pressure over P99).

With positive family history we determined 44,58% of preschoolers (father or mother with obesity, hypertension or some diseases).

New low fat diet (LF) in comparison with traditional (T) social diet has less cholesterol, total and saturated fat, and more carbohydrates and dietary fibres what is desirable for prevention of CVD for general population. Comparing booth diets showed that the satisfied % of RDA for most vitamins and minerals were higher in LF diet than in T.

This primary prevention program with "high risk strategy" and "population strategy" in childhood can be more efficient in prevention of atherosclerosis risk factors at this age.

Key words: preschoolchildren, CVD risk factors, prevention

Introduction

Cardiovascular diseases (CVD) in our region take the first place in the structure of the general mortality with about 60%, and with 19% the second place in general morbidity, therefore CVD are an important medical, social and economic problem. Unbalanced family and social nutrition and irregular life style can be associated with high incidence of obesity (50-55% adult population with BMI over 25), hypertension (18% adults with artery tension over 18,7/12,3 kPa), hypercholesterolemia (TC over

5,20 mmol/L in 71,1–83,2% population over 21 age in the last 3 years) hypertriglyceridemia (TG over 1,70 mmol/L in 41,7–51,7% population over 21 age), diabetes (7% of population now, and 2,3% 10 years ago) smoking (58,6% in male and 46,62% in female) and other risk factors. (Pavlovic, et al., 1995).

Epidemiological studies show a positive correlation between morbidity and mortality of CVD in adult population with early atherosclerotic lesions and risk factors level in children, adolescents and adults. (Blakburn., 1991.)

Analysing the risk factors obesity was found in 14,4% girls and 15,3% boys, elevated cholesterol (TC) level in 11,6–12,8% boys and girls, high LDL-C in 20,5% schoolchildren, low HDL-C in 18,3-21,6% girls and boys, elevated triglycerides (TG) in 22,1–25,6% boys and girls, and low motor ability (LMA) was established in 36,–40,1% of schoolchildren.

The frequency distribution of some risk factors shows, that there are 31,6–31,9% girls and boys have no risk factors. (Pavlovic, 1994.)

The results of an analytical questionnaire of our family nutrition shows that about 62% families consume more than 30% fat, 45% of them over 10% refined sugars, and 52% of them over 10% of saturated fatty acids considering their daily energy diet. Daily intake of salt over 6 g has been determined in 15,8% of families, cholesterol over 300 mg in 53% of them, and ratio of polyunsaturated to saturated fatty acids =P/S less then 0,45 in 54% of them. At the same time the lack of dietary fibres (less than 20 gr/day in 89,7%), most minerals and vitamins have been established. (Pavlovic, 1994.)

The risk factors are numerous and have cumulative effect, and the presence of one or more risk factors at the same time increases the possibility of development of the more serious form of atherosclerosis in ever younger age. Many reports review the evidence that the precursors of atherosclerosis begin in childhood. The majority of risk factors are connected with eating habits and life style patterns already adopted in childhood and youth. The correlation between risk factors level found in early youth and their later values ("tracking fenomen") is the most important fact for primary prevention of atherosclerosis in childhood. (WHO, 1990., Berenson et al., 1991., Mahoney et al., 1991.)

Therefore the early discovery of CVD and the undertaking of prompt preventive measures in childhood is necessary in order to reduce the risk factors, morbidity and mortality caused by CVD. (Berenson et al, 1994.)

Taking into consideration our typical family nutrition and other CVD risk factors, social nutrition has to correct inadequate nutrition in family. Based on previous results, our traditional social nutrition of preschoolers in day care centers needs changes. Therefore we intervened with a preventive program "My heart, healthy heart" in the whole population of preschoolers (age 3–7) in Subotica. This primary prevention program involves two complementary approaches, "high risk strategy" and "population – health promotion strategy". (NCEP, 1992.)

The purpose of this preventive program has been to change current diet evaluate nutrient adequacy of social nutrition, promotes the healthy nutrition and life style, and identify children with some risk factors or with positive family history.

Method

Intervention preventive program "MY HEART, HEALTHLY HEART" started this year in whole population of preschoolers (age 3-7) in Preschool Child Care Center in Subotica. (Poster: "My heart, healthly heart").

The computer software has been designed for use in primary prevention ("High risk strategy") of CVD risk factors in childhood. (Pavlovic 1995.) This program includes the following modules for children: personal data, with code system, anthropometric parameters (body height, weight, triceps and subscapular scinfolds, midarm, waist, hip circumference) physiological parameters (systolic and diastolic blood pressure, heart rate) laboratory analyses (blood glucose, total cholesterol, triglycerides, LDL-cholesterol, HDL-cholesterol), clinical examination, physical ability and activity (by the battery of tests of explosive strength, belly muscles repetitive strength, flexibility, whole body coordination, sprint speed endurance). WHO, 1988., Kostic et al., 1993, WHO 1983., Report of the Second task force on blood pressure control in children, 1987.)

For each child and his/her parents, beside mentioned data in children, the program collects and evaluates data about family history (both parents and grandparents), smoking, alcohol consumption, physical activity, etc. (Bray 1992., WHO 1988., WHO 1983., Prevention of Coronary Heart Disease 1993.)

This program automatically evaluates for children's and parents' all of parameters according to age, sex and international standards. Thus, using this program we can list the children with some risk factors (obesity, hypertension...), with positive family history, and with cumulative risk factors for selective screening lipid parameters and undertaking some individual preventive measures.

The program automatically supplies statistical reports for a group for all variables and their distribution according to standards.

The other part of this program is population "Health protomiton strategy" with dietary intervention which involves:

- ◆ constant meal planing (Low fat diet) for every two weeks (Pavlovic et al. 1994., Edelstein 1992.)
- ◆ training food services personnel,
- ◆ modified menu (more cereales, grains, fruit, vegetables, less fat and fat meat and milk products) with an additional afternoon snack
- ◆ modification of recipes and food preparation
- ◆ nutrition education for children and their parents
- ◆ constant analysing and controlling the quality of prepared meal by chemical bromathological analysis, with finally reccomentations for changing to improve nutrition
- ◆ nutrient values in traditional (T) and low fat diet (LFD) evaluated by computer meal planning program ("MENU") calculated from the food used for meal preparing in recipes (Pavlovic et al. 1994.)
- ◆ average results of nutrient intakes with 2-3 meals for two weeks were compared for T and LFD
- ◆ nutrient adequacy was determined by comparing the selected nutrients with RDA and calculating the % supply of some nutrients (RDA, 1994.)

In some of centers children have had everyday physical activity in order to promote healthy life style.

Results

- ◆ Analysing preschoolers (2422) children in Subotica with some risk factors we found with obesity 14,88–15,65% girls and boys (body weight over P97), significant hypertension 4,15–4,49% boys and girls (systolic blood pressure P95–99) and severe hypertension 4,07% boys and 3,63% GIRLS (SYSTOLIC blood pressure over P99).
- ◆ With positive family history we determined 44,58% of preschoolers (father or mother with obesity, hypertension or some diseases).
- ◆ Analysing children with different number of total risk points we found only 1,74% of children without risk points, 68,96% with 1–5 points, 22,71% with 6–10 points, 5,51% with 11–15 points, 0,9% with 16–20 points and 0,12% with 21–25 points.
- ◆ Comparing traditional (T) and low fat diet (LFD) the percentage of total calories from cereals (41,25%), milk (15,14%), vegetables (9,18%) and fruit (7,52%) were higher in LFD than in T (37,44%, 9,32%, 8,92%, 0,0%) while the meat (21,01%) and meat products with fat (15,66%) were higher in T diet.
- ◆ The energy and protein intakes were similar in T and LF diet.
- ◆ The total fat was higher in T (37,00% E) than in LF (27,97%E), carbohydrates were 49,00%E and 60,88%E, SFA 13,6%E and 9,13%, ratio P/S 0,5 and 0,8, cholesterol/1000 kcal was 126 mg and 119 mg, respectively.
- ◆ The satisfied % of RDA in T and LFD for energy (57,46%, 58,52%) and protein (83,27%, 90,09%) were similar. The percentage of satisfied RDA was higher in LFD than those in T diet for calcium (62,12%, 37,25%), phosphorus (114,02%, 65,55%), iron (115,20%, 51,70%), magnesium (90,10%, 40,01%), zinc (48,90%, 17,40%), vitamin A (139,53%, 73,17%), vitamin B1 (93,33%, 67,78%), niacin (112,73%, 63,91%), vitamin C (109,76%, 50,07%), vitamin B6 (74,62%, 37,69%), vitamin D (109,30%, 56,50%). The satisfied percentage of EDA was higher in T diet than in LFD only in B 2 vitamin (140,00%, 98,00%) and B12 vitamin (92,80%, 69,60%).

Conclusion

- ◆ Relatively great number of children, in our environment, even at this age, have one or more risk factors with familiar aggregation.
- ◆ The essence of the reduction and elimination of the risk factors for atherosclerosis and CVD is early detection and undertaking preventive measures to balance nutrition and having more physical activity.
- ◆ New LF diet in comparison with T diet has less cholesterol, total and saturated fat, and more carbohydrates and dietary fibres what is desirable for prevention of CVD for general population. (Williams, 1995.)
- ◆ These results show that LF diet satisfies the needs for majority of nutrients (except B2 and B12 vitamin) in higher percentage than T diet.

- ◆ LF diet can support normal growth and development of children after age 2 and therefore it can be implemented in the early CVD prevention, with constant growth monitoring and prevention of other risk factors. (Nicklas et al. 1992.)
- ◆ This primary prevention program with "high risk strategy" and "population strategy" in childhood can be more efficient in prevention of CVD risk factors at this age. (Vartianinen et al. 1995., Lapinleimu et al. 1994., Strong 1991., Berenson et al. 1991., Resnicow et al. 1991., Van Horn et al. 1995.)

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