The Markers of Cardiovascular Risk in the Roma in Western Slovakia

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Original Article

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Abstract:

Introduction and aim: Nutritional studies point to the importance of the quality of food consumed in the pathogenesis of cardiovascular disease before the total amount of food consumed. The aim of the study was to evaluate the cardiovascular risk of Roma in western Slovakia on the basis of selected markers.
Materials and methodology: In our study, we determined the following parameters: total cholesterol, triacylglycerols, homocysteine, vitamin B9 and vitamin B12 in 320 probands aged 20-60 years.
Results and discussion: In the Roma population, we found a significant decrease in vitamin B9 and a significant increase in vitamin B12 compared to the majority population.
Conclusion: The Roma population consumes little fruit and vegetables, which was confirmed by low concentrations of

folic acid. Based on the findings, more effective education in the field of diet and eating habits should be developed which would be used in primary prevention in the Roma population.

Introduction and Aim

Cardiovascular diseases are among the most common and serious diseases in humans. More than half of the population over the age of 40 suffers mainly from heart and vascular diseases. Lifestyle factors, including nutrition, play an important role in the etiology of cardiovascular disease. In 2013, the WHO agreed with all Member States on global mechanisms to reduce the burden of preventable non-communicable diseases. The plan aims to reduce premature deaths from non-communicable diseases by 25% through 9 voluntary global targets by 2025. Two of the global targets directly focus on the prevention and control of cardiovascular disease, which is the global cause of mortality (1).

The Roma are the largest ethnic group in Europe, with an estimated population of 10-12 million (2). According to the data of the Atlas of Roma Communities from 2019, it is estimated that the total number of persons of Roma origin is 440,000 inhabitants of Slovakia which is 8.06% of the total population of the country (3). The larger Roma community lives in 804 municipalities and towns in Slovakia and smaller groups in 373 other municipalities. They are concentrated mainly in the south and east of Slovakia. A large part of the Roma declare their Slovak and Hungarian nationality.

The aim of our study was to evaluate the cardiovascular risk of Roma in western Slovakia by determining selected markers.

Material and Methods

The study group consisted of a randomly selected and subjectively healthy population in the age range of 20 - 60 years. Probands came from western Slovakia and were divided into two groups: majority and Roma (Tab.1). Blood pressure, weight, height and BMI were measured for each proband. Blood was collected in the morning on an empty stomach after standard food intake in the previous days before collection. Total cholesterol and triacylglycerols were determined in serum by standard laboratory methods using a Vitros 250 automated analyzer (Johnson & Johnson, USA). Vitamin B9 and B12 were determined in the serum of the Elecsys 2010 Immunoassay test (Boehringer). Total homocysteine was determined in plasma by high performance liquid chromatography (HPLC method) using fluorescence detection (4). The lifestyle of the probands was evaluated in the form of a frequency questionnaire, in which the nutritional regime was also evaluated. Student's t-test was used for statistical evaluation of the data.

Results

The study had the same number of probands in both groups, with the same age range and mean age. Also, the blood pressure in both monitored groups was within the recommended reference values (Table 1).Favorable lipid values were measured in both groups, although triacylglycerols in the Roma population approached the risk limit of the recommended values (Table 1).Concentrations of homocysteine, which is an indicator of cardiovascular disease, are the same in both groups. Vitamin B9 and B12 are important for the proper regulation of homocysteine in the body. Vitamin B12 concentrations are significantly higher in the Roma compared to the majority group, but both groups have concentrations in the reference range. Vitamin B9 concentrations are significantly reduced in the Roma, ie they have a high deficit in the Roma population (Table1).

Discussion

With growing knowledge about lifestyle, the basic lifestyle of all people is changing. Based on national strategies, great attention is paid to development in the field of health care. Long-term high blood pressure causes serious illnesses, such as stroke, heart and kidney disease (5,6,7). In view of the rapid development of the aging population and eating habits, it is increasingly important to prevent the occurrence of hypertension (8,9). Despite different lifestyles and eating habits, we did not find any difference between the majority and minority populations in our study.

Scientific studies declare that the consumption of animal fats, which contain cholesterol and

Table 1 The group characteristics, concentrations of selected markers of cardiovascular risk

	Majority group	Roma
n	160	160
age range (y)	20-60	20-60
average age (y)	40.50 ± 1.13	39.46 ± 0.96
BMI (kg/m^2)	24.54 ± 0.35	28.95 ± 0.42
systolic pressure (mmHg)	120.57 ± 1.80	132.59 ± 2.30
diastolic pressure (mmHg)	73.15 ± 1.20	83.27 ± 1.50
total cholesterol (mmol/l)	5.01 ± 0.03	5.09 ± 0.04
triacylglycerols (mmol/l)	1.52 ± 0.02	1.81 ± 0.02
homocystein (µmol/l)	9.80 ± 0.40	10.32 ± 0.60
vitamin B9 (µmol/l)	18.61 ± 0.91	9.41± 0.86
vitamin B12 (µmol/l)	295.52 ± 15.00	382.41± 16.00

The results are expressed as mean ± SEM

saturated fatty acids, causes hypercholesterolemia in the body, while unsaturated fatty acids which are the source of plants, have a cholesterol-lowering effect (10). Consumption of a high-fiber diet is a prevention of the risk of cardiovascular disease (11). The hypocholesterolemic effect of fiber is explained by the binding to bile acids and the increase in fecal sterol excretion. Fermentation of soluble fiber produces short chain fatty acids that inhibit cholesterol synthesis in the liver. Whole grains, legumes, fruits, vegetables and various types of nuts are very good sources of fiber (12,13).

Vitamin B12 is absent from plant foods; bacteria in the lower part of the small intestine are its only source in subjects with exclusive consumption of plant foods (14). Vitamin deficiency can have many adverse health consequences: folate "flap" in the methylation cycle; deterioration of DNA biosynthesis; pernicious anemia; increased atherogenic homocysteine in the blood; neural tube defects (15). Consumption of dairy products and eggs, meat intake provides a better ability to meet the needs of vitamin B12 for the body (14,16). One of the many functions of vitamin B12 is its involvement in the metabolism of homocysteine, which has atherogenic properties. Homocysteine is a sulfur amino acid that is metabolized in two ways by B-group vitamins - remethylation (requires vitamin B9 and B12), which converts homocysteine back to methionine, and transsulfurization (requires vitamin B6), which converts homocysteine to cysteine and taurine (17). In vitamin B12 deficiency, the remethylation cycle is inhibited and HCy is not degraded to methionine.

Conclusion

Concentrations of several selected markers of cardiovascular risk are more favorable in the majority population compared to the Roma, which is a consequence of a more suitable composition of the diet which is rich in fruits and vegetables. Based on the findings, more effective education regarding eating habits should be developed, which would be applied in primary prevention in the Roma population.

Conflict of Interests

The authors declare that there is no conflict of interest in connection with the published article.

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References

1. ORGANIZATION WHO (2021) Global action plan for the prevention and control of non-communicable diseases 2013–2020 [online] [cit.2021-01-16].Availablefrom: https://www.who.int/nmh/publications/ncd-action-plan/en/.
2. Communication from the Commission to the

European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions: An EU Framework for National Roma Integration Strategies up to 2020 (2011). Brussels: European Commission; 2011 [online] [cit.2021-01-16]. Available from http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri= CELEX:52011DC0173&from=HR.

3. ATLAS OF ROMA COMMUNITIES IN SLOVAKIA 2019 (2019) *Office of the plenipotentiary of the Slovak Republic for the Roma Community* 2019[online] [cit.2021-01-16]. Available from https://www.minv.sk/?atlas-romskych-komunit-2019.
4. HOUZE P, GAMRA S, MADELEINE I, BOUSQUEA B, GOURMEL B (2001) Simultaneous determination of total plasma glutathione, homocysteine, cysteinylglycine, and methionine by high performance liquid chromatography with electrochemical detection. J Clin Lab Anal 2001; 15:144-153. https://doi.org/10.1002/jcla.1018.
5. GAZDIKOVA K., SUNOVA J. FARKASOVA D (2015) Nutrition and health. In *Nursing horizon* 2015; 1-2, 10-14.
6. MOSER M (1992) Yale University School of Medicine Heart Book. William Morrow & Co NY, USA 1992, 1, 1- 432. ISBN-10: 0688097197.
7. STROKE ASSOCIATION HIGN BLOOD PRESSURE AND STROKE (2021) [online] [cit.2021-01-16], Available frome https://www.stroke.org.uk/sites/default/files/high_blood_pressure_and_stroke.pdf.
8. MONGE A, LAJOUS M, ORTIZ-PANOZO E, RODRIGEZ BL, GONGORA JJ, LOPEZ-RIDAURA R (2018) Western and Modern Mexican dietary patterns are directly associated with incident hypertension in Mexican women: A prospective follow-up study. *Nutr J2018*; 17, 21. DOI: 10.1186/s12937-018-0332-3.
9. RAI SK, FUNG TT, LU N, KELLER SF, CURHAN GC, CHOI HK (2017) The Dietary Approaches to Stop Hypertension (DASH) diet, Western diet, and risk of gout in men: Prospective cohort study. BMJ 2017; 57, 1794. DOI:10.1136/bmj.j1794.
10. MATTSON FH, GRUNDY SM (1985) Comparison of effects of dietary saturated, monounsaturated, and polyunsaturated fatty acids on plasma lipids and lipoproteins in man. *J Lipid Res 1985*; 26, 94-202. PMID: 3989378.
11. RAJARM S, SABATE J (2000) Health benefits of a vegetarian diet. *Nutr 2000*; 16, 531-533. DOI:10.1016/s0899-9007(00)00305-1.
12. KELLY JH, SABATE J (2006) Nuts and coronary heart disease: an epidemiological perspective. British journal of Nutrition 2006; 96 (2), S61-S67. DOI: 10.1017/BJN 20061865.
13. LAMPE JW (1999) Health effects of vegetables and fruits: assessing mechanisms of action in human experimental studies. *Am J ClinNutr 1999*; 70, 475-490. DOI:10.1093/ajcn/70.3.475s.
14. KRAJCOVIVCOVA-KUDLACKOVA M, BLATICEK P, KOPCOVA J, BEDEROVA A, BABINSKA K (2000). Homocysteine levels in vegetarians versus omnivores. *Ann NutrMetab 2000*; 44, 136-138. DOI: 10.1159/000012827.
15. VARELA-MOREIRAS G, MURPHY MM, SCOTT JM (2009) Cobalamin, folic acid, and homocysteine. *Nut Rev 2009*; 67, 69-72. DOI: 10.1111/j.1753-4887.2009.00163.x.
16. KRAJCOVIVCOVA-KUDLACKOVA M, BLAZICEK P, MISLANOVA CS, VALACHOVICOVA M, PAUKOVA V, SPUSTOVA V (2007) Nutritional determinants of plasma homocysteine. *Bratislava Med J 2007*; 108, 510-515. PMID: 18309641.
17. RASMUSSEN K, MOLLER J (2000). Total homocysteine measurement in clinical practice. *Ann ClinBiochem 2000*; 37, 627-648. DOI:10.1258/0004563001899915.