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Stroke Epidemiology in Novi Sad

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Abstract

The research results of stroke epidemiology during favorable social, political and economic circumstances at the Collaborative Center of the WHO MONICA project in Novi Sad from 1984, show a reduction in incidence and mortality from stroke, and indicate that prophylactic measures performed during the first ten years were successful at completing their mission, i.e. morbidity and mortality from stroke dropped by about 20%. The main activities were concerned with recording the incidence and mortality of stroke and analysis of population sample during intervention program. The results of Stroke epidemiology from 1993 and later show that, with the war in the neighboring countries, the decline in general living standards of the population, and economic sanctions imposed by united nations, this beneficial trend has reversed and rates have increased continually. The results of the WHO MONICA project in novi sad collaborating center are undergoing the final analyses and tests of hypotheses, and they are published in the most reputable world medical journals. Unfortunately, in the first decade of XXI century in vojvodina in population age 20 years and over the main risk factors are still physical inactivity, hypertension, smoking, overweight, and obesity, the same that were at the beginning of the WHO MONICA program, at the end of XX century. Such, much worse health reality among younger, requires integrated strategic approach supported by policy, capacity building, supervision and propagation of medicine treatment and care.

Keywords: Epidemiology; Stroke; WHO MONICA project

Introduction

Since the foundation of the World Health Organization (WHO) in 1948, during the last 70 years, improved nutrition, education, immunization, quarantine, insecticides, antibiotics and other biomedical products helped to reduce the rates of many diseases caused by deficiency, bacteria and parasites, in many industrialized countries. However, life expectance failed to improve proportionately, due to an increase in deaths from cardiovascular and Cerebrovascular Diseases (CVD), i.e. stroke as their main representative [1].

Today, Non-Communicable Diseases (NCDs) represent a leading threat to human health and development. The four most common NCDs, stroke, malignant diseases, chronic obstructive pulmonary disease and diabetes, are associated with common preventable risk factors related to lifestyle [2]. Epidemiological research of stroke, make a permanent, continuous quest for answers to epidemiological observations of everyday medical and especially neurological and cardiology practices. Blood vessels, brain and heart vascular diseases attracted more attention at the middle of last century when they reached large proportions in USA, and when their health care service organized a comprehensive study in the city of Framingham in 1948 to investigate the causes. This was the moment when Risk Factors (RF) concept was born: smoking, high cholesterol and hypertension. Also, these RF, and large geographical diffusion of atherosclerosis, is connected with stroke morbidity and mortality, especially in economically and socially developed countries throughout the world.

In 1950, Ancel Keys pointed out the harmful effects of fast food on mortality, and the link between cholesterol and ischemic heart disease, and he organized the seven countries Study "(1958-1970): USA, Italy, Greece, Japan, Netherlands, Finland, and Yugoslavia, when the influence of eating habits and education on the morbidity of stroke was confirmed.

The WHO MONICA Project

Despite the great research and scientific efforts, many epidemiological questions were left unanswered, so the MONICA (Monitoring of trends and determinants in Cardiovascular disease) Project was initiated in 1979 in Bethesda. It has become the largest research study of cardiovascular diseases and stroke ever

undertaken worldwide [3].

The objectives of the MONICA Project were to measure the trends in cardiovascular mortality, coronary heart disease and stroke morbidity as well as assessing the degree to which these trends are related to changes in known RFs, daily living habits, health care and major socioeconomic features, measured at the same time in defined communities in different countries. The MONICA Project has proven that it is possible to monitor the classic RFs for CVD in a large population through a ten-year period. Moreover, it has proved possible to standardize procedures within centers over the study period. It was also apparent that, for some of the factors, e.g. smoking and blood pressure, the measurement accuracy improved during study period [4].

MONICA combined the old with the new. It emphasized standardized measurement of mortality, morbidity, risk factors, and medical care. In addition, it combined these potentially routine activities with the publication of quality control results on the Internet, the testing of hypotheses, and the publication of study results in prestigious scientific journals. This hypothesis could not have been tested within one population alone, or without the WHO.

The WHO MONICA Collaborative Center in Novi Sad (YUG-NOS 49)

MONICA Collaborative Center Novi Sad (MCC NS) was one of the participants in the WHO MONICA Project, and was the only MONICA population in former Yugoslavia. Citizens aged 25-64 from the city of Novi Sad, a multiethnic and multicultural society of some 20 nationalities took part in it. There were several hospitals, a medical center and a university medical school involved. Mortality from stroke was the highest in the country. The response to population research was very good. Health service of Novi Sad successfully passed the strict criteria and was highly rated for its research. The first MONICA survey determined the levels and distribution of major RF, contributing to preventive work on coronary disease and stroke. Following the 1982 WHO report on regional differences in standardized stroke mortality rates in Socialistic Federal Republic (SFR) Yugoslavia which was unfavorable for the population of Vojvodina, Novi Sad Health Service started doing research within The MONICA Project. The study was established in 1983 and was supposed to last for 10 years. During the conduction of the study our country fell apart, due to its participation in war operations in surrounding countries, Yugoslavia was isolated from the international community and it suffered UN sanctions. Because of this Novi Sad MONICA center extended its work after the study has reached its end and Project lasted until 2005. Novi Sad MCC was a unique link between our country and international community during the period of isolation and sanction from 1992 to 1996 and from 1998 to 2001.

The aim of the study was to measure the trends of the cerebrovascular morbidity and mortality, as well as to assess their correlation with the changes in main risk factors, lifestyle, development of the health service and socio-economic characteristics that were measured simultaneously in defined population. Data on the ischemic stroke of the population age 25-64 were collected together with the data on the presence of risk factor obtained by examining the population representative sample in 1984, 1988 and 1994 [5]. After the diagnostic categorization was performed using an algorithm in accordance to MONICA protocol, event registration was done [1].

During the period from 1983 to 2005 10.874 strokes were registered in general population: male 52% and female 48%. Mortality rate during 28 days was 53,3%. At the end of the first ten years incidence rate was reduced to 15,3%, and at the end of the study it is increased by 53%. The Mortality rate was initially reduced to 48%, and at the end of the study for 21%.

In the MONICA population, 3324 cases of stroke were registered: 30,6% of all of stroke events in general population. At the end of the study the incidence rate was for 10% higher, and mortality rate at the first ten years there was a decrease of 20%, but at the end of the study it is increased by 33,5%.

Considering the significant differences in the movement of incidence and mortality in the study period from 1983-1992 and then until 2005, the results were separately analyzed. In the first period incidence was 12% lower and the mortality rate 21% lower on the annual level. During the duration of the UN sanctions (1992-1995) ischemic stroke incidence was increased 26,6%, and lethality 2,7%, and at the end of the second period the incidence was 30% higher and mortality for 33,5%.

Relation between Gross National Product rates, incidence and mortality stroke rates from 1983 to 1995 shows compliance directly with the living standard of the population. In the period 1983-1990 morbidity and mortality from stroke fell by about 20%. Since 1991, and especially from 1992, with war circumstances and economic sanctions, this beneficial trend has reversed and rates have steadily increased. The circumstances in which the prophylactic project for ischemic stroke is conducted directly proportionately affects the gained results. The research results of MCCNS are undergoing the final analysis and tests of hypotheses and are published in the most reputable world journals [6].

The main activities were concerned with recording the incidence of stroke, analysis of population samples and carrying out intervention program. During favorable social, political and economic circumstances, the results of decreased number of stroke incidence and mortality reduction indicate that prophylactic measures at the first period 1983-1992 were successful completion of a mission [7,8].

As a leading health problem all over the world stroke and other CVD has been followed up in many countries for more than several decades. In East and South-East Europe, the frequency of these diseases is still very high, in spite of growing significance of primary and secondary prevention measures. In the developed countries in Central and Western Europe there is a decline in stroke morbidity and mortality for a long time. With the economic crisis and political and social changes, the number of acute stroke events grows also in that part of Europe. The frequency of many conventional RFs in recent years, such as smoking, hypertension, obesity, metabolic syndrome and impaired Glico-regulation disorders, and insufficient physical activity, has been increasing. Besides the medication therapy, treatment of stroke also includes very important hygienic-dietetic measures such as salt reduction in food, weight loss, quitting smoking, reduced intake of alcohol, fatty foods and saturated fatty acids, as well as the ability to handle stressful situations accompanied by regular physical activity.

Primary prevention of stroke risk factors and early detection of asymptomatic forms of illness are very important. In about 8% of patients with brain stroke the RF was not detected, so further investigations of RF are required. It is important to record markers for bad prognosis and predictors of new stroke events, so that patients with high RF can be separated and supervised and receive secondary prevention therapy [9].

Despite this, still in 2006 in north province of Serbia, in Vojvodina, the main RF in population aged 20 years and over are physical inactivity (65,4%), hypertension (46,1%), smoking (37,5%), overweight (35,2%), and obese (20,5%). About 7% of adults who drink alcohol are in the group with moderate risk for developing chronic disease, while 3,7% of those are heavy drinkers. Such situation requires integrated strategic approach supported with policy, capacity building, surveillance and dissemination [2].

Furthermore, the new global assessments repeat the need to take action on tobacco use, physical inactivity, overweight and lack of fruit and vegetables in the diet, as well as their mutual manifestations; elevated cholesterol, blood pressure and blood sugar. The challenge is essential and demands complex multi-sectoral approaches including upstream policy interventions, cost-effective health promotion and practice of clinical prevention [1].

In the last decade, the question of serological markers in CVD prediction was raised, since the conventional RF covers it only partially. There is a need for new researches apart from genetic researches [3].

The use of drugs in the MONICA Project was studied using two approaches. First, clinical, was used in the score study testing. The second, hypothesis on coronary care, pharmacological and epidemiological, was used in the optional study on drugs. The study has shown that the intensity of pharmacotherapy in MCCNS was the lowest of all populations for which comparable data existed. Most data that support this notion refer to beta-adrenergic receptor blockers. During the MONICA Project evidence-based treatment guidelines have been developed, incorporating the results of all large clinical trials and meta-analysis of available tests [10].

Methodological issues related to the selection and application of the sampling method for monitoring cardiovascular diseases in multinational, multi-centric WHO MONICA project, the sample which was used for periodical evaluation of changes in RF levels, were very carefully collected and finally analyzed, and mandatory data collection of RF's in the city area of Novi Sad, transferred to Data Centre in Helsinki, became a part of an international open-source database [11].

Conclusion

During the period of favorable circumstances, the results of reducing incidence and mortality from coronary and cerebrovascular diseases indicate that take of prophylactic measures during the first ten years period were successful completion of a mission [8].

Multi-centric, multinational and scientific research WHO MONICA Project, apart from having large scope and large statistical background, also has a great scientific influence measured by about 6000 citations at the base of Web of Science Citations Index [12].

Without prophylactic measurements, it is not possible to give favorable results in these very complex health fields, and actually the main risk factors in population age 20 and over, still in 2006 in Vojvodina, are the same as they were at the beginning of the WHO MONICA project 25 years ago. Such a situation requires integrated strategic approach supported with policy, capacity building, supervision and dissemination [2].

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