

Ischemic stroke and prevention

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ABSTRACT

Vascular cerebral episodes or strokes not only they are the third cause of death (10% worldwide, following cardiovascular diseases (13%) and cancer (12%), but they also affect younger people, according to statistics, with a huge social and financial impact. (Dokoutsidou et Antoniou, 2009) The Objective of this study was to review the literature regarding both risk factors and prevention issues about stroke. (Dokoutsidou et Antoniou, 2009)

Methods followed included review of the literature and research for investigational studies and reviews on ischemic stroke, in Greek and international databases. (Dokoutsidou et Antoniou, 2009)

Results: According to the literature, risk factors for ischemic stroke are categorized in not modifiable (sex, age, nationality – race, inherited traits) and modifiable, such as arterial hypertension, smoking, alcohol misuse, malnutrition, atrial fibrillation, hyperlipidemia, diabetes mellitus, obesity etc. (Dokoutsidou et Antoniou, 2009)

Conclusions: According to the literature, the most crucial factor in the prevention of ischemic stroke is modification of risk factors. (Dokoutsidou et Antoniou, 2009)

Stroke was recognized as a disease entity since thousands years before, in ancient Greece. Hippocrates used the term “apoplexy” to describe the sudden loss of senses and paralysis. The term “stroke” is used to describe the event of sudden and dramatic development of neurological deficit, as a result of acute obstruction or bleeding in one or more blood vessels of the brain leading to necrosis of brain areas fed by those vessels. (Dionysiotis, 2006)

Today we are aware that stroke often leads to death or permanent disability with functional and neurological deficits. It is the third cause of mortality in developed countries and it is also the first cause of disability in man. In Greece, according to statistics of World Health Organization, 25,000 incidents of stroke occur annually. (Dionysiotis, 2006)

KEY – WORDS: Stroke, prevention, risk factors.

INTRODUCTION

Stroke has evolved to a major threat for health and life. The numbers related with strokes are disappointingly large. Stroke is the third cause of mortality worldwide and the second in ages >65 years. (InCardiology) It is also the most widespread causal factor for neurological dysfunction and the second for dementia. Fifteen million people suffer from new-onset stroke each year, and hardly 25% of them recover fully. In the first three months following acute stroke, mortality reaches to 25% of the total incidents, while in ages >85-years the respective number is 40%. Among survivors, 25- 50% develops disability or dependency, 50% is unable to walk, 50% is aphasic, and 30% suffers from depression. (InCardiology)

In 2002, stroke was the third cause of mortality worldwide (10% of deaths), following coronary heart disease (13%) and cancer (12%). Despite that fact that stroke may occur at any age, the elderly have a much greater risk. Two thirds of the incidents happen in persons >65-years old, and risk for a stroke is doubled each decade after 55 year of age. (InCardiology) According to epidemiological findings from U.S.A., it is estimated that more than 500.000 to 600.000 Americans present with ischemic stroke annually and furthermore, almost 150.000 of them will die during the first month. Consequently, ischemic stroke is the third cause of death in general population and the first in people >75 years of age. Forty-three percent of strokes occur in individuals over 65-years old. (InCardiology)

Men have a higher incidence of ischemic strokes compared to women. According to those findings, more than 2.000.000 survivors of ischemic stroke suffer from a wide range of deficits and disabilities. (InCardiology)

In Greece, the burden is higher; according to World Health Organization for the period 1990–1992, mortality from strokes was much higher than the average in Western countries. In fact, mortality in Greece is estimated to 130 cases per 100.000 of population per year, while in Italy and U.S.A. is estimated to only 80 and 50, respectively. (Panas et al, 1999)

Even more worrisome is the fact that Greece is one of the few countries where mortality had an increase between 1985–1989 in comparison to 1960–1964, according to World Health Organization. (Vassilopoulos et al, 1996)

These facts underline an imperative need for early diagnosis, treatment and mainly prevention of stroke, in more effective ways. (Vassilopoulos et al, 1996) Due to the permanent disability as a result of an ischemic stroke, prevention has particular importance. All healthy adults should have an annual routine evaluation of their health, including neurological and cardiological examination, blood pressure measure and blood laboratory testing (blood lipids, blood glucose etc.). Of course, smoking and alcohol should be avoided or quitted. Particular attention must be given to the appearance of any symptom indicating a possible transient ischemic attack (most often, weakness or numbness of a limb, blurred vision in one eye, dysarthria). (Kaparos, 2007)

Treatment should be better defined by a specialized neurologist, given that every patient is an individual case of the disease (for example, severity and clinical course may differ). (Kaparos, 2007)

Therefore, especially health professionals (doctors, nurses etc), should be aware of the risk factors for a stroke. These are summarized at table 1.

These data show that there is an imperative need for early and effective prevention of stroke. (Dionysiotis, 2006)

Prevention should be addressed, in fact, to the entire world population. Risk factors may be distinguished in two categories: modifiable and not modifiable. Not modifiable are factors that their effect may not be altered by any intervention. Not modifiable factors include sex, age, inheritance, and race – ethnicity. (Panas et al, 1999).

Modifiable factors, are those on which we may intervene and potentially alter, such as:

CONTROL OF BLOOD PRESSURE

Control of blood pressure is a powerful measure of prevention. It is estimated that control of blood

Table 1. Risk factors for a stroke

NOT MODIFIABLE	POTENTIALLY MODIFIABLE	MODIFIABLE
AGE	OBESITY	HYPERTENSION
SEX	LACK OF PHYSICAL ACTIVITIES	ATRIAL FIBRILLATION
GENETIC PREDISPOSITION	ALCOHOL	DIABETES
RACE/NATIONALITY	HORMONAL SUBSTITUTION TREATMENT	LIPIDS
	CONTRACEPTIVES	SMOKING
		CAROTID STENOSIS

(Dionysiotis, 2006)

pressure (systolic less than 160mmHg and diastolic less than 90mmHg), may decrease the incidence of stroke at least by 40%. Blood pressure values may be decreased with a proper diet and physical exercise, of course. In a person with hypertension where the effort to manage through diet, weight loss and exercise is unsuccessful, antihypertensive medication should be used. Reduction of blood pressure to its normal level is one of the most important prevention measures against stroke. (Healthvisitor, Wolf PA, 1998, Cardiological Rostrum , 2008)

SMOKING

Smoking is one of the most important risk factors. It is estimated that smokers have a greater risk for stroke and in particular, their risk is higher if smoking is combined with high blood pressure. Smoking causes vasoconstriction of blood vessels which results to decrease of blood flow. Smoking should be quitted by all means. The risk of individuals smoking 10 cigarettes per day is double than non-smokers', while for heavy smokers (more than 40 cigarettes daily) this risk is 4 times higher. (Healthvisitor, Bronner, et al, 1995)

ALCOHOL ABUSE

The risk of stroke related to alcohol abuse has not been established. On the contrary, in cases of chronic alcohol abuse the risk is higher because the heavy consumption of alcohol may affect blood pressure. It is therefore important to limit alcohol consumption to a reasonable level. Nevertheless, what is apparently certain is that routine consumption of small quantities of alcohol (10gr or 1 glass of wine daily) has a protective effect, decreasing the risk of stroke. (Lai, et al, 1994, Healthvisitor)

DIET – EXERCISE

A healthy diet may considerably decrease the risk of stroke. On the contrary, high consumption of salt is related to high blood pressure. Additionally, high consumption of saturated fat (red meat, fried foods, chips) lead to increased blood cholesterol (mainly LDL-cholesterol, known as 'bad cholesterol') and to a high probability for stroke. Individuals consuming fruits, vegetables and virgin olive oil have a lower risk. The role of omega-3 fatty acids is very important, as they are necessary for human health and they may be found in fatty fish (salmon, tuna, sardines, mackerel), walnuts (rich in alpha linolenic acid, which is a type of omega-3 fatty acids). American Heart Association recommends eating fatty fish at least 2 times per week. Omega-3 fatty acids play a crucial role in brain function and they reduce triglyceride levels and risk of heart diseases. (University of Maryland Medical Center)

Diet containing high concentrations of antioxidants also reduces the risk. Vitamin C has a protective effect. It is contained in fresh fruits and vegetables. Green tea, moderate consumption of red wine, berries, and cocoa, with their high concentration in flavonoids, decrease the risk, helping prevention atherosclerotic plaque formation. (University of Maryland Medical Center)

Physical training: regular physical exercise decreases the risk of stroke. Exercise improves collateral circulation. Increase of physical activity and starting a program of physical exercising guided by doctor is important for everyone. (Healthvisitor)

HEART DISEASES

The risk of stroke is increased in the presence of several heart diseases (atrial fibrillation, heart failure, myocardial infarction, heart valve disease, coronary heart disease etc). For example, in atrial fibrillation, clots are formed within the heart, which is not operating satisfactorily and embolization of coronary arteries or brain vessels is possible. Other heart diseases include heart failure, coronary heart disease, heart valve disease and myocardial infarction, which is mainly related to atrial fibrillation and it is common cause for cardiogenic embolism. (Vassilopoulos et al, 1996 , Dokoutsidou et Antoniou, 2009)

DIABETES MELLITUS

The probability of stroke in a diabetic patient is two times higher than in general population, regardless of the presence of hypertension or other risk factors. Diabetes mellitus is therefore an independent risk factor, causing microvasculopathy and accelerating atherosclerosis in vessels of intermediate and large diameter, while hyperglycemia seems to aggravate an ischemic episode increasing the size of the infarct. Effective treatment of diabetes mellitus (by diet, oral hypoglycemic medication or insulin) does not decrease all risk. However, it is very important to control diabetes under expert guidelines. (Panas et al, 1999, Healthvisitor)

HYPERLIPIDEMIA

Increased level of serum cholesterol is a risk factor for ischemic stroke. A correlation with arteriosclerosis of large-diameter blood vessels has been showed. A similar relationship also exists for LDL-cholesterol, but the inverse for HDL-cholesterol. The role of triglycerides has not been completely clarified, but in post-mortem studies there is a relation with arteriosclerosis of small-diameter blood vessels. (Kalfakis et al, 2002)

Other risk factors are: vascular diseases, blood diseases, oral contraceptives, and coagulopathies. Stress and depression have been implicated as well

as obesity (mainly of central type), that tends to perceive an epidemic size. Lack of physical exercise, migraine, drug use (mainly cocaine) and intense physical and mental stress increase the risk for a stroke. (Panas et al, 1999, *Cardiological Rostrum*, 2008)

All of the above highlight the fact that prevention should be attempted on a long term basis. For certain risk factors, such as obesity, prevention should begin in childhood; for others, such as arterial hypertension, it should last in lifetime. (*Cardiological Rostrum*, 2008)

We all should understand the importance of prevention and take measures to improve and promote it, as well as measures to avoid and discourage all unhealthy ways of life, for example, smoking and alcohol abuse. (Dokoutsidou et Antoniou, 2009, *Cardiological Rostrum*, 2008)

Health professionals, and especially nurses, should have as their main aim to prevent diseases and educate individuals and their families. (Healthvisitor) Although prevention of stroke is a challenge, it is not impossible. It includes health education of the population about aforementioned risk factors of stroke, such as hypertension, transient ischemic attacks, diabetes mellitus, heart diseases, obesity, smoking and contraceptive medicines. (Healthvisitor) During this process, nurses should recruit and develop all their mental, physical and social reserves, mainly

in order to make individuals that belong in high risk groups to quit unhealthy habits (smoking, alcohol, malnutrition) which are predisposing factors for stroke. (Healthvisitor)

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