Review article

Current status of stroke epidemiology in Greece: A panorama

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Angelo V. Vasiliadis [a,*], Milorad Zikić [b]

[a] School of Physical Education and Sports Science in Serres, Aristotle University of Thessaloniki, Greece
[b] Private praxis Novi Sad, Serbia

ABSTRACT

Although strokes have been documented since about 3 millennia, they remain today as one of the leading causes of mortality, as well as of subsequent serious long-term physical and mental morbidity, among patients in many different countries all over the world. Greece presents an increase in mortality rates according to World Health Organization, and this fact underlines the need for early diagnosis and treatment, as well as, the need to implement effective prevention strategies for strokes. This review makes an effort to describe the current status of stroke epidemiological features, as well as to present the risk factors prevalent in Greece. The incidence rate is 261–319/100,000 based on the recent population based registry. Stroke appears to be more prevalent in men than in women, and the mean age of stroke onset in Greece is at 70 years of age. Hypertension, atrial fibrillation, dyslipidaemia and diabetes mellitus are the major risk factors of stroke in the Greek population, while smoking is the most commonly documented modifiable risk factor in young adults with ischemic stroke. Similar to other parts of the world, ischemic stroke is the most common stroke type. The 28-day case fatality rate for men and women was 26.5%. The mean in-hospital cost per stroke patient was 3624.9 € and the mean rehabilitation cost of outpatients with stroke was 5553.3 €, while the cost proportion of hemorrhagic stroke is higher when compared to ischemic stroke. Stroke is a devastating condition with recognized challenges in identifying effective prevention programs. In Greece, limited data exists regarding the epidemiology of strokes. As a result, the need to conduct new studies and researches across the country is well documented.

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1. Introduction

Stroke incidences and familial stroke occurrence have been reported as early as 2700 years ago, in ancient Mesopotamia and Persia [1]. Hippocrates (460–370 BC) was the first person to provide detailed accounts of strokes, referred to as apoplexy, from the Greek word ἀποπληξία, meaning 'struck down with violence', and describing the incidences as resulting in a sudden collapse, a loss of consciousness and paralysis. From

* *Corresponding author at*: School of Physical Education and Sports Science in Serres, Laboratory of Exercise Physiology and Biochemistry, Aristotle University of Thessaloniki, Greece. Tel.: +30 6948402828; fax: +30 2310541610.
E-mail addresses: vasiliadisvangelo@hotmail.com (A.V. Vasiliadis), milorad.zikic@gmail.com (M. Zikić).

Fig. 1 – Map of Greece showing the different places where stroke studies have been conducted.

the late 14th to the late 19th century the word 'apoplexy' was also used to describe any sudden death which began with a sudden loss of consciousness, as well as to describe the symptom of a sudden loss of consciousness which immediately preceded death [2]. Little was known back then about the cause of strokes, and the only established therapy was to feed and care for the patient until the attack ran its course [3].

Nowadays, a stroke, or "brain attack" is recognized as the third most common cause of death in many developed countries, following coronary heart diseases, and all cancer types combined [4,5]. Annually, statistics show that fifteen million people worldwide suffer a stroke episode. Of these, nearly five million die and another five million are permanently disabled, experiencing loss of vision and/or speech, muscle weakness and confusion [6,7]. Although stroke can affect all ages, the chance of having a stroke approximately doubles for each decade of life over the age of 50, while it appears uncommon in people below 40 years of age [8]. Stroke is so common [9] that it should not come as a surprise that most people know of someone who has suffered a stroke, or have a close family member who has faced a stroke episode.

Europe occupies a large geographical area, in which about one million of the stroke incidences occur each year [10]. Data on strokes vary and show large differences across countries, and even across geographical areas within the same country

[11]. Geographic comparisons of stroke incidences within countries are valuable, in order to help identify high risk populations as well as to define preventive and effective intervention programs [12,13]. However, comparability of stroke studies might be hampered by several methodological differences in data collection, leading to limitations in their findings [13,14]. In Greece, a typical Mediterranean country, there is lack of epidemiological studies of strokes and these studies present a geographical inequality and a wide variation among data [15,16].

Thus, the objective of the study in question has been to provide an overview analysis of the epidemiological context of strokes (incidence rates, mortality rates, risk factors), as well as to outline recent trends in treatment patterns and finally present the economic aspects of stroke treatment. These data will be used in order to estimate the total stroke burden in Greece (Fig. 1).

2. Epidemiological context

2.1. Incidence rates

Incidence information relates to the number of new cases of strokes for a given year per 100,000 inhabitants. The estimated