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Prevalence of Lebanese stroke survivors: A comparative pilot study

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Abstract Stroke is a leading cause of morbidity and mortality worldwide and its late burden has mainly been attributable to developing countries. Lebanon is one of these countries where epidemiological studies on stroke burden are scarce but necessary. Thus, the present study was conducted to assess the prevalence of stroke survivors among Lebanese inhabitants. A cross-sectional survey was carried out using randomly selected landline phone numbers on all governorates to retrieve data on stroke survivors and their sociodemographic characteristics. Results were then standardized over the Lebanese and the World Health Organization (WHO) world populations. A total of 6963 Lebanese inhabitants were included in the study; among these were 56 stroke survivors. This led to an adjusted stroke prevalence of 0.50% [95% confidence interval (CI) = 0.33–0.66%] and a world-standardized prevalence of 0.60% (95% CI = 0.42–0.78%). A significantly higher stroke prevalence was found among older age groups and more socioeconomically privileged areas. Overall, the study showed a relatively higher prevalence of stroke in this sample of Lebanese inhabitants when compared to other developing countries. However, larger community-based studies with a clinical assessment of stroke cases are needed to confirm our findings. © 2015 Ministry of Health, Saudi Arabia. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Stroke is the second leading cause of death [1] and the third leading cause of disability-adjusted life

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years worldwide [2]. In fact, 5.9 million deaths and 102.2 million disability-adjusted life years, lost throughout the world, were attributable to stroke in 2010 [3,4].

However, classification of causes of death and disability differs between high and low to middle-income countries (HICs and LMICs, respectively) [5], and changes dramatically over decades [1]. Studies have shown that stroke incidence in HICs has been always elevated compared with LMICs [6] until the past few decades, where incidence in LMICs has exceeded that of HICs by 20% [6,7]. These trends in incidence rates are accompanied by similar trends in mortality rates [6]. The expected effect of these changes, from 1990 to 2020, is an increase in stroke prevalence by 120–137% in LMICs compared to an increase of 30–60% in HICs [8].

Incidence and mortality rates of stroke are mainly affected by the prevalence of behavioral cardiovascular risk factors [9] and by the advances in its early diagnosis and management [8]. However, these factors are influenced by socioeconomic considerations (education, income, occupation) [10], which explains the difference in the epidemiology of stroke between countries of different incomes.

The Arab world is a region of 22 countries with wide socioeconomic disparities and unequal distribution of wealth, science, and technology [11,12], where trends of stroke are not precisely established [13]. However, many estimates about noncommunicable diseases (NCDs) exist mainly from studies conducted in HICs, such as Bahrain, Kuwait, and Saudi Arabia [13,14]. In 2008, 60% of all deaths in the region were attributable to NCDs, with large variations between countries: 27% in Somalia, an LIC, to 84% in Oman, an HIC [13]. Despite this, stroke is classified among the top five causes of death in all countries [12]. Furthermore, we find a high prevalence of physical inactivity (may reach 90% among women), smoking (38% in Lebanon), obesity (40% in the Arab Gulf countries), and diabetes (20% in the Arab Gulf countries) among Arab populations [15–18].

Lebanon is an Arab country of the Middle East region classified among LMICs, based on the 2008–2012 World Bank's country classification and the World Health Organization (WHO) classification, where available studies on NCDs have shown a high prevalence of cardiovascular risk factors (obesity 26% [19], diabetes 14% [20], and hypertension 36% [21]). Moreover, stroke is assumed to be the second leading cause of death in the country.

However, studies focusing on overall stroke prevalence or incidence rates are scarce among all Arab countries [14]. Thus, we conducted a pilot study to assess the prevalence of stroke survivors in Lebanon and provide a reliable set of data on stroke epidemiology for subsequent studies and analyses.

2. Materials and methods

We performed a cross-sectional study between January and March 2012 to detect persons living with a history of stroke (stroke survivors) among Lebanese inhabitants. We adopted a multistage sampling. First, we calculated the sample size needed to obtain a 95% confidence level. For this purpose, community-based studies from Arab countries were examined to fix the minimum expected stroke prevalence (0.2%; CI width = 0.2%) [22,23]. A total of 7600 participants were needed. Then, we examined the 2005 distribution of the Lebanese population among governorates and districts to establish our sample in a more or less proportionate way (see Table 1). A list of landline phone numbers of all households, provided by the government, was obtained to randomly select the households' sample among each governorate. Then, all members of the household were included in the study. We assumed that on average, four persons are found in each household. Thus, a total of 2000 calls were performed, allowing for a 10% nonresponse rate, which later resulted in 1779 answers more or less adequately distributed on all governorates.

After including all members of the household in the study, we obtained a total sample of 6963 participants. The interviewer explained the study objectives to the respondent, who was kept anonymous. After giving his oral consent, the respondent was asked a number of questions within 10 min. The questionnaire had two major sections; one related to sociodemographics, and one related to stroke identification. Each respondent was first asked about the number, sex, and age of inhabitants in his household and the number of rooms in the household (to later calculate the crowding index which is the number of persons per room, usually related to the socioeconomic status) [19].

Stroke cases were then identified with the question that raises the existence, among the house inhabitants, of a person having a history of "*Jalta Dimaghiya*" diagnosed by a physician (we asked 'Have you ever been told by a physician that you suffered a stroke?'). "*Jalta Dimaghiya*" is the Arabic synonym of stroke and the most familiar and specific term for the disease in Lebanon.

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