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Differences in Incidence of Stroke Subtypes between Men and Women

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Stroke is a common cause of mortality and morbidity worldwide. Both men and women are affected by stroke, but have differing incidence rates and outcomes. Previous studies provide evidence that women have worse functional outcomes after stroke. Women also have worse outcomes after tissue plasminogen activator treatment [1], and those with symptomatic intracranial arterial stenosis are at a higher risk of ischemic stroke (IS) or vascular death than men [2].

Regarding this issue, Thrift et al. [3] reported their findings on differences in stroke subtypes between men and women, obtained from the NEMESIS (North East Melbourne Stroke Incidence Study). Using the results of a survey region comprising 22 postcodes (population 306,631) and spanning the years 1997–1999, the authors found that the age-adjusted incidence of IS and intracranial hemorrhage (ICH) was greater in men than in women, while the incidence of subarachnoid hemorrhage was greater in women than in men. Although population-based stroke incidence studies have shown differences in stroke incidence between men and women [4], few studies have compared the age-adjusted incidence of stroke subtypes between men and women. The incidence of stroke subtypes in a particular region is necessary for understanding the likely impact of stroke prevention, detection and treatment strategies. The Thrift et al. [3] study may improve our understanding of and ability to manage sex-related differences in stroke patients. For example, the greater incidence of subarachnoid hemorrhage in women may suggest the need for vigorous screening for and aggressive management of aneurysms, and the greater incidence of IS and ICH in men may suggest the need for stricter management of traditional risk factors.

In this study, more men than women had a history of smoking and diabetes mellitus, which is likely to have contributed to the higher incidence of IS and ICH in them. Besides traditional risk factors, the differences between men and women in cardiovascular impact appear to be attributable to a combination of factors related to sex (biological status determined by sex chromosomes

and their interactions with autosomes, X chromosome inactivation, sex hormones and related determinants) as well as gender (determined by the social, cultural and educational shaping resulting from societal influences and geoethnic modulation) [5]. In addition, these sex and gender differences may apply not only to cardiovascular disease, but also to stroke. Sex differences in coagulation, the impact of sex hormones on the vascular environment and genetic backgrounds may separately or together help to explain the sex differences in stroke [6].

This study focused on sex differences in stroke subtypes, but provided no information on differences in the occurrence of the subtypes of IS, such as large artery atherosclerosis, cardioembolism and small vessel occlusion (lacunar infarction). The pathophysiology of IS subtypes differs, and hence the differences between men and women in the occurrence of IS subtypes are important. Understanding sex differences in IS subtype incidence rates would be useful in preventing IS, especially in the management of vascular risk factors. I hope that the authors will investigate IS subtype differences between men and women in future.

This study is an initial step in the attempt to prevent stroke onset by focusing on sex differences. However, the frequency of stroke subtypes varies among countries and even among regions in the same country. It would be interesting and important to know whether the pattern of greater incidence of IS and ICH and lesser incidence of subarachnoid haemorrhage in men is present in other countries or other regions in Australia. If not, it would provide further evidence for the heterogeneity of stroke incidence both between and within countries. Because of this heterogeneity, stroke prevention strategies focusing on sex differences may be most effective if aimed at a regional rather than a national level. Moreover, this study may provide a baseline that can be used to assess the changes in incidence or sex differences in the developmental years, since changes in the rate and type of stroke may occur in reaction to environmental and lifestyle changes in various countries and regions. Future population-based age-adjusted investigations that are focused on sex differences are needed in many countries and many regions in order to provide comparisons with this study.

Stroke is a preventable disease; hence, effective primary and secondary prevention strategies are likely to have an effect in reducing stroke incidence. We need to develop more understanding of sex differences in stroke incidence, presentation, prevention and treatment effectiveness. Understanding how sex and gender differences translate into each stroke subtype will help improve the prevention and management of stroke in both women and men.

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