The official journal of the Japan Atherosclerosis Society and
the Asian Pacific Society of Atherosclerosis and Vascular Diseases

Editorial

J Atheroscler Thromb, 2022; 29: 1699-1700. http://doi.org/10.5551/jat.ED202

Importance of Continuous Monitoring of Stroke Recurrence in the General Population

Naoyuki Takashima

Department of Public Health, Kindai University Faculty of Medicine, Osaka, Japan

See article vol. 29: 1759-1773

Over the past few decades, the age-standardized stroke incidence and mortality rate have declined in Japan[1]. However, there is limited evidence for the incidence and recurrence rate of stroke based on population-based studies. A meta-analysis of 59 randomized control trials for secondary stroke prevention observed the declined trend of stroke recurrence over the past five decades[2]. In Japan, a recent population-based stroke registry reported that the annual recurrence rate of stroke was 3.2%[3]. This recurrence rate was lower compared to the previous reports in Japan conducted 10–30 years ago. Therefore, the recurrence rate of stroke seems to have reduced over the few decades. However, there is limited evidence for the long-term trend of stroke recurrence in Japan.

Recently, Nakanishi *et al.* reported that the recurrence rate of stroke has decreased over the past half-century in Japan[4]. The recurrence rate of stroke decreased mainly during the 1960s to 1990s; however, no apparent decreasing trend of the recurrence rate of stroke is observed in recent years[4]. Similar results were observed in the United Kingdom, the recurrence rate of stroke was also noted to be unchanged over the last decade[5]. Moreover, in Japan, decreasing trends of stroke incidence were observed to be slowed down in recent years[6, 7]. These observations suggest that both primary and secondary prevention of stroke in real-world setting might not have an impact as expected. Several studies or surveys reported insufficient risk factors control[8, 9]. In the real-world setting, adherence to stroke prevention in high-risk populations might be lower than we expected. These results suggested the importance of continuous monitoring for stroke incidence and recurrence in the general population to access the effectiveness of the stroke prevention act in real-world setting.

Several previous studies have reported the vascular risk factors and lifestyle factors for stroke[10]. These factors are targets for both primary and secondary prevention for stroke[8]. According to the National Health and Nutrition Survey, smoking rate and population blood pressure levels have been decreasing over the past few decades[9]. The decreasing trends of stroke incidence as well as recurrence might be explained by the decreasing smoking rate and population blood pressure as major risk factors. Over the past decade, there was an increasing trend in the prevalence of medication for dyslipidemia and total serum cholesterol levels but an unclear increasing trend in non-HDL (high-density lipoprotein) cholesterol levels[9]. Increasing trend in total serum cholesterol levels might be explained by the increasing trend in the HDL cholesterol levels[9]. Despite the rapid westernization of lifestyle, the favorable trend in non-HDL cholesterol levels seems to be due to the effective intervention of dyslipidemia. The prevalence of diabetes seems to be increasing during the 2000s, but level off during the 2010s[9]. The decline or unclear decreasing trends of stroke incidence and recurrence in the recent year might be partially explained by these trends of risk factors. There have been developing medical technologies for acute stroke care. Computed tomography (CT) and magnetic resonance imaging (MRI) scanners have become widely available in Japan. A minor stroke might have a chance to be diagnosed as a stroke using these devices. The acute case fatality rate of stroke has been decreasing. Acute stroke death is a significant competing risk for stroke recurrence. Therefore, the decrease in acute case fatality rate might influence the recurrence risk of stroke. Due to decline in the incidences and recurrences of stroke, larger study

Address for correspondence: Naoyuki Takashima, Department of Public Health, Kindai University Faculty of Medicine, Osaka-Sayama, Osaka, Japan
Received: April 13, 2022 Accepted for publication: April 13, 2022

populations might be needed to evaluate the trend of stroke recurrence. Further studies might be required to reveal the prevalence of risk factors for stroke and adherence to primary and secondary stroke prevention medication in real-world setting.

No apparent decreasing trend of stroke recurrence was observed in recent years[4]. Similar trend was observed for the stroke incidence. These unfavorable trends of stroke incidence and recurrence in recent years might reemphasize the importance of public health measures to provide continuous primary and secondary prevention of stroke. Continuous monitoring of vascular risk factors and lifestyle factors is necessary. Furthermore, continuous monitoring of stroke incidence and recurrence might be needed to evaluate the effectiveness of the primary or secondary prevention of stroke.

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None.

Conflict of Interest

None.

References

1) Global, regional, and national burden of stroke, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. The Lancet Neurology, 2019; 18: 439-458
2) Hong KS, Yegiaian S, Lee M, Lee J and Saver JL: Declining stroke and vascular event recurrence rates in secondary prevention trials over the past 50 years and consequences for current trial design. Circulation, 2011; 123: 2111-2119
3) Takashima N, Arima H, Kita Y, Fujii T, Tanaka-Mizuno S, Shitara S, Kitamura A, Miura K and Nozaki K: Two-Year Recurrence After First-Ever Stroke in a General Population of 1.4 Million Japanese Patients- The Shiga Stroke and Heart Attack Registry Study. Circulation journal: official journal of the Japanese Circulation Society, 2020; 84: 943-948
4) Nakanishi Y, Furuta Y, Hata J, Yubi T, Oishi E, Sakata S, Hirakawa Y, Wakisaka Y, Ago T, Kitazono T and Ninomiya T: Long-Term Trends in The 5-Year Risk of Recurrent Stroke over A Half Century in A Japanese Community: The Hisayama Study. J Atheroscler Thromb, 2022; 29: 1759-1773
5) Forrester J, Golbus J, Brede D, Hudson J and Richardson B: B cell activation in patients with active procainamide induced lupus. J Rheumatol, 1988; 15: 1384-1388
6) Hata J, Ninomiya T, Hirakawa Y, Nagata M, Mukai N, Gotoh S, Fukuhara M, Ikeda F, Shikata K, Yoshida D, Yonemoto K, Kamouchi M, Kitazono T and Kiyohara Y: Secular trends in cardiovascular disease and its risk factors in Japanese: half-century data from the Hisayama Study (1961-2009). Circulation, 2013; 128: 1198-1205
7) Takashima N, Arima H, Turin TC, Nakamura Y, Sugihara H, Morita Y, Okayama A, Miura K, Ueshima H and Kita Y: The 21-Year Trend of Stroke Incidence in a General Japanese Population: Results from the Takashima Stroke Registry, 1990-2010. Cerebrovasc Dis, 2022; 1-7
8) Kinoshita M, Yokote K, Arai H, Iida M, Ishigaki Y, Ishibashi S, Umemoto S, Egusa G, Ohmura H, Okamura T, Kihara S, Koba S, Saito I, Shoji T, Daida H, Tsukamoto K, Deguchi J, Dohi S, Dobashi K, Hamaguchi H, Hara M, Hiro T, Biro S, Fujioka Y, Maruyama C, Miyamoto Y, Murakami Y, Yokode M, Yoshida H, Rakugi H, Wakatsuki A and Yamashita S: Japan Atherosclerosis Society (JAS) Guidelines for Prevention of Atherosclerotic Cardiovascular Diseases 2017. J Atheroscler Thromb, 2018; 25: 846-984
9) e-Stat Protal Site of Offical Statistics of Japan. Statistics Bureau, Ministry of Internal Affairs and Communications, Japan, https: //www.e-stat.go.jp/en
10) Ueshima H: Explanation for the Japanese paradox: prevention of increase in coronary heart disease and reduction in stroke. J Atheroscler Thromb, 2007; 14: 278-286