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Editorial

Unconventional, Yet Important, Risk Factors for Stroke

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Conventional risk factors such as hypertension, diabetes, dyslipidemia, and smoking can explain only 60% to 80% of stroke occurrence;[1,2] therefore, preventive strategies that consider unconventional risk factors are needed for a more comprehensive stroke prevention. In this issue of *Journal of Stroke*, three review papers have been published on such factors including air pollution,[3] sleep disturbances, [4] and heart failure.[5]

The significance of these risk factors is less clear when compared with conventional risk factors. Nevertheless, they may have a large impact on our vascular health. For example, air pollution may be a less important risk factor than hypertension at the individual level; however, we have to consider the ubiquitous nature of exposure and the significance of its impact at a population level. Therefore, clear identification of the risk of air pollution exposure will not only improve the care of individual patients via risk avoidance advice, but also place pressure on policy makers to consider these issues as a public health priority. The resulting political and social implementation will greatly reduce stroke burden, particularly in low- and middle-income countries where air pollution is severe.[6]

Sleep disturbances, such as obstructive sleep disorder and insomnia/hypersomnia, may have less of an impact socially and politically; however, they appear to be fairly common risk factors in the adult population. The risk of sleep disorders may be modifiable, although the therapeutic effectiveness of continuous positive air pressure treatment on stroke prevention has not yet been verified. Further clinical trials are needed to find ways to prevent stroke by modulating the hazardous effects of sleep disturbances.

Heart failure is another common, yet neglected, risk factor for stroke. The tardiness in research on stroke in patients with heart failure is partly attributed to a high risk of bleeding associated with warfarin, a conventional anticoagulation treatment. Recent treatment advancements have included non-vitamin K antagonist oral anticoagulants (NOACs) that are associated with less bleeding risk. Therefore, additional research is needed to elucidate whether NOACs can be used safely and effectively in the prevention of stroke in patients with heart failure or to identify patients who would benefit from NOAC treatment.

The three reviews correctly show the difficulty in identifying the magnitude of risks associated with these factors after adjusting for conventional risk factors and clarifying preventive effects after adjusting for their influence. Nevertheless, these reviews are important because they provide excellent insights on the neglected risk factors for stroke and will stimulate further research in these issues.

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