

A ten year follow-back study for the risk of developing cardiovascular disease associated with indoor temperature

Shintaro Ando^a, Toshiharu Ikaga^b, Tanji Hoshi^c and Takumi Maekawa^a

^aThe University of Kitakyushu, 1-1 Hibikino, Wakamatsu-ku, Kitakyushu, Fukuoka, Japan; ^b Keio University, 3-14-1 Hiyoshi, Kohoku-ku, Yokohama, Japan ; ^c Tokyo Metropolitan University, 1-1 Minami-osawa, Hachioji-shi, Tokyo, Japan ; s-ando@kitakyu-u.ac.jp

In Japan, cardiovascular disease is the most common cause of death and long-term care, a major cause of which is hypertension. It is estimated that one-third of Japanese have hypertension¹. The effects of indoor air temperature on cardiovascular disease including hypertension have recently been attracting attention. Umishio (2014) showed that systolic blood pressure increased by 0.43 mmHg per 1.0°C decrease in indoor air temperature². These effects were not sufficiently established, however, as the causal sequence was not taken into account.

A field survey comprising indoor temperature measurement and a questionnaire was administered in November 2013. Also, a follow-back study was conducted in order to investigate the onset of cardiovascular disease from 2003 to 2013. The targeted area is a rural village in Yusuhara town (Kochi Prefecture, Japan). About 1,500 people live in this area.

In this study, 214 subjects with a dataset from 2003 to 2013 were analyzed. 183 subjects did not have hypertension in 2003. Of them, 46 (incidence rate 25.1%) developed it during the ten year period. Furthermore, 205 subjects had not had strokes before 2003. Of them, 8 (incidence rate 4.0%) had strokes during the period.

The relationship between onset of disease and differences in mean room temperature was studied. In the hypertension cases, the daily mean air temperature experienced was 14.78±2.26°C in onset group (n=46) and 15.28±2.56°C in non-onset group (n=137). In the stroke cases, it was 13.80±2.19°C in onset group (n=8) and 15.11±2.64°C in non-onset group (n=198). The room temperature was found to be lower in onset groups in both cases, but there were no significant differences. Significant differences (p<0.05) were however shown for temperature differences between AM 1:00 to 5:00. The results indicate that low indoor air temperature after midnight affects the onset of cardiovascular disease.

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References:

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