The Great East Japan Earthquake and Out-of-Hospital Cardiac Arrest

To the Editor: The most powerful earthquake ever recorded in Japan, with a magnitude of 9.0 on the Richter scale, struck the northeast region of Japan on March 11, 2011 (Fig. 1A).1,2 Earthquakes are known to increase the risk of sudden cardiac arrest.3 Using a nationwide population-based database, we assessed the association between this earthquake and the occurrence of out-of-hospital cardiac arrest of presumed cardiac origin.4,5

Our study involved adult patients with out-of-hospital cardiac arrest of presumed cardiac origin who were transported to medical institutions in Iwate, Miyagi, and Fukushima — the three prefectures that were most damaged by the earthquake (Fig. 1A). The study included data from 4 weeks before to 8 weeks after March 11 in each year from 2005 to 2011. Weekly changes in the occurrence of out-of-hospital cardiac arrest after the earthquake were assessed with the use of Poisson regression models to calculate risk ratios comparing the observed numbers of patients with out-of-hospital cardiac arrests in each week with the expected numbers of such events. Expected numbers of events were estimated with the use of data from 2005 to 2010 on the number of events, according to the weekly average ambient temperature, the week, and the year during that period. Risk ratios were also calculated according to sex and age group.
A total of 6733 adults were confirmed to have out-of-hospital cardiac arrest of presumed cardiac origin in the three prefectures. The risk of out-of-hospital cardiac arrest was significantly increased in the first week (risk ratio, 1.70), second week (risk ratio, 1.48), third week (risk ratio, 1.26), fourth week (risk ratio, 1.25), and fifth week (risk ratio, 1.24).
The risk of out-of-hospital cardiac arrest did not increase significantly among men 75 years of age or older, the risk of out-of-hospital cardiac arrest did not increase significantly among women in the same age group during the first 2 weeks after the earthquake (Fig. 1B). Among men 75 years of age or older, the risk of out-of-hospital cardiac arrest increased during the first 2 weeks after the earthquake and again in the first week after maximum aftershocks with a magnitude of 7.2 on April 7 and 7.0 on April 11 (Fig. 3 in the Supplementary Appendix). Among women 75 years of age or older, the risk was increased in the first, third, and fourth weeks after the earthquake (Fig. 4 in the Supplementary Appendix).

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