余震の強度は心血管系の健康に直接影響する（Abstract # 13-A-13796）

日本における2011年の地震による余震は心筋梗塞および突然死を倍増した

Aftershock of the Japan 2011 earthquake linked to a doubling in myocardial infarctions and sudden death

地震およびそれに続く余震による急性の情動的および身体的ストレスは、心疾患率の低い人々においても心筋梗塞（MI）および突然死の誘因として重要である可能性があるとの研究結果が第62回American College of Cardiology学会で発表された。研究者らは日本における2011年の地震およびその後の津波を被った地域におけるMIと心臓突然死を発症した患者の誘因および臨床的特徴を評価した。最初の最大の地震は2011年3月11日に発生し震源地のマグニチュードは9.0であった。岩手ではこれにより震度5.6の地震が起きた。2つ目の地震は4月7日に発生した震度5.5の地震であった。それまでの年と比較し、この災害後4週間のMIおよび突然死発生総数は倍であった。津波の影響を受けた地域と内陸とで有意な差は認められなかった。これらの結果および心イベントと自然災害とを関連付けた他のスタディから、自動体外式除細動器の公共配置や病院における高度な災害計画などの予防措置をとることの必要性が強調される。筆者らはまた、高リスク患者には薬剤（即効性カルシウム受容体拮抗薬、β遮断薬、アスピリンおよびニトログリセリン舌下錠）を供給し手元に置かせることも提案している。

Full Text

Acute emotional and physical stress induced by earthquakes and subsequent aftershocks may be important triggers of myocardial infarction (MI) and sudden death, even in a population with low rates of heart disease, according to research presented at the American College of Cardiology's 62nd Annual Scientific Session.

Researchers assessed the incidence and clinical characteristics of patients with an acute MI and sudden cardiac death in the area affected by the 2011 earthquake and subsequent tsunami in Japan. Patients with myocardial infarction treated in all hospitals located in the disaster area were assessed retrospectively for four weeks before and eight weeks after the disaster. Subjects who experienced sudden death, defined as death within one hour after onset, prior to arrival at the hospital were also assessed by death certificate. For comparison with the previous year's case numbers, the same assessment was conducted in the corresponding area and time period for 2009 and 2010. There were no significant differences in age, gender, preexisting heart disease or in-hospital death between the before and after periods.

There were clear peaks in the incidence MI and sudden death in the week after each of the two major shocks of the Japan natural disaster. The first, main shock occurred March 11, 2011, with a magnitude of 9.0 in the epicenter. In Iwate, this produced seismic intensity—the strength of the shaking— of 5.6. The second happened at midnight on April 7 with a seismic intensity of 5.5 in the study area.

Researchers found a significant relationship between the number of MI and sudden death and seismic intensity. Compared to previous years, overall incidence of MI and sudden death four weeks after the disaster was significantly increased. In the study area, incidence of MIs, including sudden cardiac death, doubled. No significant differences in the increase of the prevalence rate were found between the tsunami-impacted and inland area.

"These data suggest that acute emotional and physical stress induced by the earthquake itself rather than the long-term environmental deterioration by the tsunami is an important trigger of heart attacks and sudden death. Several previous studies suggest the time of shocks, especially early morning, is important to the increase in heart attacks and sudden death," said Motoyuki Nakamura, M.D., professor of internal medicine, division of cardioangiology, Northern Iwate Heart Disease Registry Consortium, Iwate Medical University, Morioka, Iwate, Japan, and one of the study authors. "However, in our case, it's the intensity of the shocks themselves, rather than the time window, that appear to be related to the increased incidence as both earthquake shocks clearly increased the incidence in the present disaster regardless of time."

While the researchers did not study the underlying cause of the rise in MIs and sudden death, Dr. Nakamura speculates that the combination of emotional and physical stress, along with a shortage of food and water and increased dehydration, may have conspired to increase blood pressure, heart rate and blood clotting and may have resulted in plaque rupture.

Dr. Nakamura added that the death rate of patients admitted to the hospital did not increase after the disaster, suggesting that medical staff working in the field may have been able to maintain the usual quality of care for patients even amid insufficient medical staff, shortages that well preceded the disaster.

Researchers believe their findings and those of other studies linking cardiac events to natural disasters underscore the need to take preventive measures, such public distribution of automated external defibrillators, especially in areas with frequent earthquakes or other disasters, as well as advanced hospital disaster planning to address how to transfer patients to nearby hospitals and leverage other support services. Dr. Nakamura also suggests a supply of medications such as quick-acting calcium channel blockers, beta blockers, aspirin and sublingual nitroglycerin be kept on hand for high-risk patients to help prevent cardiac events.

This study was supported, in part, by the Japan Science and Technology Agency, Takeda Science Foundation and the Japanese Circulation Society.

ACC2013特集