

Acute impact on brain function in earthquake survivors

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New research has found that the Wenchuan, China earthquake that occurred on 12 May 2008 had an acute impact on the brain function of physically healthy survivors and poses a risk to the mental health of these survivors. The results of the study, which was carried out by the Institute of Psychiatry in collaboration with colleagues from universities in China, the US and Liverpool, have been published in PNAS online today.

The researchers wanted to gain a better understanding of how functional brain systems adapt to severe [emotional stress](#). Previous animal studies have demonstrated the importance of limbic, paralimbic, striatal, and prefrontal structures of the brain in stress and fear responses. Human studies, which have focused primarily on patients with clinically established posttraumatic stress disorders, have reported abnormalities in similar brain structures. However, little is known at present about potential alterations of brain function in trauma survivors shortly after traumatic events such as an [earthquake](#).

The epicentre of the devastating 12 May 2008 earthquake occurred in Wenchuan, in the Sichuan Province of China. It measured 8.0 on the Richter scale. The most severely affected geographical regions were Yingxiu, Wenchuan, Dujiangyan, and Shifang, where 45 million people were directly affected. Among them, 69,146 people were confirmed dead, 374,131 were seriously injured, and 17,516 are missing.

A significant proportion of the survivors (around 20 per cent) are likely to develop stress-related disorders, such as acute stress disorder (ASD)

and posttraumatic stress disorder (PTSD). Dr Andrea Mechelli from the Institute of Psychiatry at King's College London and one of the authors of the study comments: 'Given the serious and persistent impact of these highly prevalent psychiatric disorders, it is vital to develop a better understanding of the alterations of cerebral function evident in the early stages of adaptation to trauma. Such knowledge may lead to a better understanding of posttraumatic responses and the development of more effective early interventions.'

Using a method known as 'resting-state fMRI', the researchers examined 44 healthy survivors and 32 controls shortly (13-17 days) after the massive psychological trauma. They found that significant alterations in brain function similar to those observed in posttraumatic stress disorders, can be seen shortly after major traumatic experiences, highlighting the need for early evaluation and intervention for the survivors.

Previous studies were performed with victims of trauma that took place years or even decades earlier. No clinical study had yet investigated alterations in cerebral function in survivors soon after a massive widespread disaster, such as an earthquake.

The results of this study demonstrate that individuals experiencing severe emotional trauma showed hyperactivity in certain areas of the brain, and decreased functional connectivity in others, shortly after the massively traumatic Wenchuan earthquake. In particular, the findings indicate that traumatic experiences affect not only regional function but also dynamic interactions within brain networks. It is not clear whether this pattern of brain alteration remains the same or evolves further over the following weeks or months after the traumatic experiences.

Dr Mechelli continues: 'A better understanding of the impact of traumatic events on brain function may help us identify those in need of early treatment and reduce the long-term psychological impact in trauma

survivors of national disasters, military conflict, and other causes of severe emotional distress.'

Longitudinal studies of trauma survivors may provide further insight into how alterations in [brain function](#) evolve over time after severe [trauma](#), as well as their relation to the potential later emergence of stress-related disorders.

Source: King's College London ([news](#) : [web](#))

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