



Earthquake Needs Prophylaxis

Amir Reza Farhoud,^{1,*} and SM Javad Mortazavi¹

¹Orthopedic Department, Joint Reconstruction Research Center, Tehran University of Medical Sciences, Tehran, Iran

*Corresponding author: Amir Reza Farhoud, Joint Reconstruction Research Center (JIRC), Imam Hospital Complex, Keshavarz Blvd, Tehran, Iran. Tel: +98-2161192767, Fax:

+98-2166681653, E-mail: am_farhoud@yahoo.com

Received 2017 April 24; Accepted 2017 June 10.

Keywords: Prophylaxis, Disaster, Orthopedics

Earthquake derived injuries were accounted as an endemic problem of Iran and neighboring countries (1). Every several years, a relatively severe earthquake shakes not only the earth but also the heart and mind of the Iranians. Again, another area of Iran, Kermanshah has tolerated a magnitude 7.3 earthquake with about 569 dead, 9000 injured, and a total of 43000 affected people (2). Respecting the principle of better outcome by prophylaxis, reducing the harm of the earthquake requires a comprehensive preparation in the context of primary, secondary and tertiary prophylaxis.

While the primary prophylaxis is the real type of prophylaxis and intends to prevent the cause of a disease, regarding earthquake, preventing it is impossible. The scope of this would be to lessen the physical and psychological damage. Therefore, primary prophylaxis demands a comprehensive governmental approach by strict rules for buildings, correct design of delivery of energy type like natural gas and electricity to buildings, and making the people ready on how to encounter and protect themselves and others from an occurred earthquake. Specific prepared groups of medical and rescue team experts in a definite type of disaster may lessen the possible injuries as well (3). It means thinking about a disaster before the disaster.

Secondary prophylaxis aims to prevent disabilities. It requires to educate, prepare, and organize health and rescue systems on to how to manage mass injured patients from an earthquake. Its scope starts from the scene to hospitals to rehabilitating and supporting systems. The type of injuries depends on specific factors like time of earthquake, the characters of the buildings, and programs designed by the primary prophylaxis. Lessons and even descriptions of previous similar crisis would be useful. Limb and spine injuries are common after a devastating earthquake (4). For example results of the Bam earthquake suggests the importance of renal protection and more conservative treatment of fractures of a crushed limb (5). The

standard condition for orthopedic surgery that prevents postoperative infection in a busy operating room in a local hospital should be provided. Nevertheless, the principle of treatment may need to modify when previous similar experiences are considered.

Tertiary prophylaxis is to treat disabilities. Although the nature of a disaster makes this type of prophylaxis inevitable, the art of governmental organizing and health systems is to shift the focus of prophylaxis to the more primary types. The main burden of expenses seems to belong to treat physical and psychological disorders of individuals surviving a disaster and to rebuild ruined buildings. This could be prepared and protected by thinking about primary prophylaxis instead. Obviously, a team approach is necessary in decreasing the effects of disabilities of survivors of a disaster. Also, this approach requires its own specific considerations relying on similar experiences of previous occurrence.

In conclusion, a harmonic approach to prophylaxis a disaster such as an earthquake is needed by considering previous similar experiences and shifting focus more on primary prophylaxis. Secondary and tertiary prophylaxis includes therapeutic measures, however, the concept of prophylaxis means planning and organizing to encounter a critical condition in advance. It is clear that tertiary type of prophylaxis has its own importance and should be planned, run, and evaluated by an experienced team again by considering previous experiences.

References

1. Amerion A, Delaavari A, Teymourzadeh E. Rate of preparedness in confronting crisis in three selected border hospitals. *J Mil Med*. 2010;**12**(1):19-22.
2. Bagheri M. Kermanshah Earthquake - Iran: Operations Update 2: *Iranian Red Crescent*. 2017, [updated 05 Dec 2017]. Available from: <https://reliefweb.int/report/iran-islamic-republic/kermanshah-earthquake-iran-operations-update-2>.

3. Coughlin RR, Roy N, Patel V. Wrong Place, Wrong Time: Coincidental Involvement in the Gujarat Earthquake, India (2001). *J Orthop Trauma*. 2015;**29 Suppl 10**:S11-3. doi: [10.1097/BOT.0000000000000406](https://doi.org/10.1097/BOT.0000000000000406). [PubMed: [26356205](https://pubmed.ncbi.nlm.nih.gov/26356205/)].
4. Kang P, Tang B, Liu Y, Liu X, Shen Y, Liu Z, et al. Profile and procedures for fractures among 1323 fracture patients from the 2010 Yushu earthquake, China. *Am J Emerg Med*. 2016;**34**(11):2132-9. doi: [10.1016/j.ajem.2016.07.064](https://doi.org/10.1016/j.ajem.2016.07.064). [PubMed: [27543441](https://pubmed.ncbi.nlm.nih.gov/27543441/)].
5. Tahmasebi MN, Kiani K, Mazlouman SJ, Taheri A, Kamrani RS, Panjavi B, et al. Musculoskeletal injuries associated with earthquake. A report of injuries of Iran's December 26, 2003 Bam earthquake casualties managed in tertiary referral centers. *Injury*. 2005;**36**(1):27-32. doi: [10.1016/j.injury.2004.06.021](https://doi.org/10.1016/j.injury.2004.06.021). [PubMed: [15589909](https://pubmed.ncbi.nlm.nih.gov/15589909/)].