

### Frequency of Bone Fractures among Hospitalized Patients Injured by the Bam Earthquake

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**Introduction:** On 26 December 2003, a devastating earthquake destroyed Bam, a city in southeastern Iran. After this event, a database was provided by a large prospective multi-center, cross-sectional study, which recruited all injured patients who remained hospitalized in five different provinces of Iran one week after the earthquake.

**Objective:** To determine the frequency of different types of bone fractures in hospitalized earthquake victims.

**Method:** Pertinent data including gender, age, and specific types of radiologically proven bone fractures were extracted from the original database.

**Results:** Of a total of 1,052 hospitalized earthquake victims, 484 (46.01%) were female and 568 (53.99%) were male. Collectively, 692 (65.8%) patients had radiologically proven fractures. The fractures were categorized into three groups. Those fractures affecting the long bones of upper and lower extremities were diagnosed in 395 cases (37.5% of the total cases). Pelvic fractures were detected in 264 cases (25.1% of the total cases), and vertebral fractures were found in 124 cases (11.8% of the total cases). A total of 91 patients were grouped in at least two of the three categories. Respectively, 348 (71.9%) and 344 (60.5%) of female and male patients had proven fractures, with mean ages of 28.9 and 29.9 years.

**Conclusion:** Bone fractures accounted for one of the most common injuries in earthquake victims and were more prevalent in the long bones of extremities compared to the pelvis and spine. Females noticeably were more prone to sustain bone fractures than men, probably due to their lower bone density.

**Keywords:** Bam; bone fractures; earthquakes; gender; injuries; Iran; patients

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### Prevalence of Acute Renal Failure in Hospital Patients Injured in the Bam Earthquake

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**Introduction:** Acute renal failure (ARF), mainly as a consequence of rhabdomyolysis, has been known to be a major medical complication in earthquake victims.

**Objective:** To evaluate the incidence of ARF and its causal factors in hospitalized victims of the Bam earthquake on 26 December 2003 in southeastern Iran.

**Methods:** In a prospective, multi-center, cross-sectional study, data were collected from 1,052 patients injured in the Bam earthquake, who were still hospitalized one week after the devastating earthquake occurred. Acute renal failure was defined as a serum creatinine level of  $\geq 3$  mg/dL detected within the first week after the earthquake.

**Results:** A total of 10.6% of the hospitalized patients, with a mean age of 28.4 years, fulfilled the study criteria for

ARF. Among those affected by ARF, 34.5% were female and 65.5% were male. A total of 71.2% of the ARF cases underwent hemodialysis. The median creatine phosphokinase (CPK) levels obtained for the ARF group after admission was 11,300 u/L (range: 132–500,000 u/L) and the median peak CPK documented during the first week after injury was 19,930 u/L (range: 598–500,000 u/L).

The mean admission of Blood Urea Nitrogen (BUN) was  $125 \pm 14.2$  mg/dL, and the peak level of BUN in ARF cases was  $139 \pm 13.5$  mg/dL. The mean creatinine on admission was  $6.04 \pm 0.58$  mg/dL and the mean maximum creatinine in ARF cases was  $6.86 \pm 0.52$  mg/dL. The mean first CPK in cases requiring hemodialysis was  $51,184 \pm 26,430$  u/L, while in non-hemodialysis cases it was  $28,736 \pm 15,500$  u/L. Patients who underwent hemodialysis were trapped in the rubble a mean of  $5.7 \pm 0.99$  hours in comparison with  $4.75 \pm 4.6$  hours in patients not requiring hemodialysis.

**Conclusion:** A considerable number of earthquake victims developed ARF, mainly due to rhabdomyolysis, in the first week following the event. Most of them underwent hemodialysis as a life-saving modality. Optimal hydration should be considered as a major prophylactic measure to reduce the likelihood of developing ARF in earthquake-injured patients.

**Keywords:** acute renal failure (ARF); earthquake; hemodialysis

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### Patients with Multiple Traumatic Injuries with Hemorrhagic Shock Treated with IVR

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**Introduction:** The characteristics and treatment for victims with multiple traumatic injuries are changing, and more exact medical treatments are being required.

**Methods:** The study was based on 20 cases, involving treatment with IVR from 1998 to 2004. For each case, blood pressure, the presence of shock, period of hospitalization, the use of arterial embolization, and survival were examined. Additionally, age, gender, alterations in consciousness, the time from injury to IVR, and the length of the hospital stay were abstracted.

**Results:** The averages of the ages of the patients was 51 years, and 15 men and four women were included in the study. The injured studied were results of eight traffic crashes, two industrial accidents, eight falls from height, and one other case. The average of the transport times was 60 minutes and of the times to IVR ranged from 46 minutes to 48 hours. Blood pressure ranged from 80–160 mmHg, with an average of 114 mmHg. Six cases presented with shock. The length of stay ranged from 0–87 days, with an average of 23 days. Arterial embolization procedures included four to the liver, two to renal arteries, four to the iliac arteries, and one to the inferior diaphragmatic arteries. Four cases died due to hemorrhagic shock.

**Conclusion:** In the case of patients with multiple traumatic injuries, IVR was considered to be useful as a quick and exact diagnostic medical treatment.