

# Characteristics of Adult Fractures in Emergency Department in Beijing Jishuitan Hospital during 2009–2016

Zhi-Wei Liu, Bin Zhao

Department of Emergency Medicine, Beijing Jishuitan Hospital, Beijing 100035, China

Fracture was a common injury in adults. Moreover, the number of fractures showed an increasing trend in previous studies. Fractures bring suffering and enormous financial burdens to patients and their families.<sup>[1]</sup> As the development of urbanization, the incidence of fractures increases gradually. However, the research on the spectrum of adult fractures has not been enough in Beijing. As a trauma emergency center of Beijing, Jishuitan Hospital is a center for adults' first aid and treatment of fractures, we designed this study to provide a reliable basis for better adjustment of adult fractures treatment and prevention.

Fracture refers to the continuity of the bone structure completely or partially broken. Fracture is a common disease with a high mortality rate in adults. And, more and more inpatient care was needed.

Medical records of adult patients with fracture who visited the emergency department of trauma in Beijing Jishuitan Hospital from January 2009 to December 2016 were retrospectively analyzed. Patients aged from 15 to 59 years old with a determined fractures diagnosis were included in this study. Patients with old fractures, pathological fractures, with soft-tissue injuries or dislocations were excluded from the study. The number of adults with fractures, age, gender, was collected. Adults were divided into three groups according to their age, namely, 15–29 years, 30–44 years, and 45–59 years groups, respectively. All results were analyzed by SPSS 17.0 for Windows.

A total of 102,464 adult patients with fracture from 2009 to 2016 are included. The annual numbers of adults with fractures from 2009 to 2016 were 10,769, 10,735, 11,255, 10,937, 11,942, 14,444, 14,819, and 17,563, respectively. The number of adults with fractures increased annually. The number of adults with fractures in the age group 15–29 years, 30–44 years, and 45–59 years old was 34,170, 32,487, and 35,807, respectively. There were the most number of fractures in 45–59 years age group, and the least number

in 30–44 years age group among the three age groups. The number of fractures in 30–44 years and 45–59 years age group increases by the year. The numbers of males and females with fractures were 66,860 and 35,604, respectively. Males were significantly more than females. The number of males with fractures from 2009 to 2016 was 7585, 7362, 7611, 7102, 7394, 9218, 9401, and 11,187, respectively. Moreover, the numbers of females with fracture from 2009 to 2016 were 3184, 3373, 3644, 3835, 4548, 5226, 5418, and 6376, respectively [Table 1]. Both males and females showed a trend of increasing by year, and males in each year were significantly more than females.

In this study, a total of 106,424 adults with fractures were collected. The number of adults with fractures in each gender and increased by year, this result was consistent with previous studies.<sup>[2]</sup> Our results showed that: First, in recent years, the process of urbanization led to an increase in the population of Beijing. An increase in the population base led to an increase in fractures. Second, fast-paced life and the prevalence of transport vehicles led to increased risk of injury. Third, an update in the concept of health led to more adults get the opportunity to rescue from fractures, people who referred to the fracture clinic in the past began to go to the hospital in time. Finally, the development of transportation makes the people in more distance to get healed.

As the growth of age, the number of adults with fractures decreased gradually from 15–29 age group to 30–44 age group. This can be attributed to two reasons. The first is that patients in 30–44 age group prefer less risky behaviors as

**Address for correspondence:** Prof. Bin Zhao,  
Department of Emergency Medicine, Beijing Jishuitan Hospital,  
Beijing 100035, China  
E-Mail: zhaobin60@aliyun.com

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**Received:** 24-09-2017 **Edited by:** Li-Min Chen

**How to cite this article:** Liu ZW, Zhao B. Characteristics of Adult Fractures in Emergency Department in Beijing Jishuitan Hospital during 2009–2016. Chin Med J 2018;131:359–60.

## Access this article online

### Quick Response Code:



**Website:**  
www.cmj.org

**DOI:**  
10.4103/0366-6999.223854

**Table 1: The number of adult fractures in each gender by year 2009-2016**

Year	Total	Males, <i>n</i> (%)	Females, <i>n</i> (%)	15–29 years, <i>n</i> (%)	30–44 years, <i>n</i> (%)	45–59 years, <i>n</i> (%)
2009	10,769	7585 (70.43)	3184 (29.57)	4813 (44.69)	2716 (25.22)	3240 (30.09)
2010	10,735	7362 (68.58)	3373 (31.42)	4354 (40.56)	2927 (27.27)	3454 (32.18)
2011	11,255	7611 (67.62)	3644 (32.38)	4202 (37.33)	3300 (29.32)	3753 (33.35)
2012	10,937	7102 (64.94)	3835 (35.06)	3686 (33.70)	3320 (30.36)	3931 (35.94)
2013	11,942	7394 (61.92)	4548 (38.08)	3489 (29.22)	3879 (32.48)	4574 (38.30)
2014	14,444	9218 (63.82)	5226 (36.18)	4250 (29.42)	4926 (34.10)	5268 (36.47)
2015	14,819	9401 (63.44)	5418 (36.56)	4368 (29.48)	5129 (34.61)	5322 (35.91)
2016	17,563	11,187 (63.70)	6376 (36.30)	5008 (28.51)	6290 (35.81)	6265 (35.67)

they get older and the second is that the bones of patients in 30–44 age group are more mature than these of patients in 15–29 age group. However, in the 45–49 age group, the prevalence of osteoporosis becomes higher. Besides, other diseases such as diabetes, which are more common in the elder age group, and correspondent treatment, may aggravate the severity of osteoporosis, leading to much more number of fracture cases in the age group of 45–49 years.<sup>[3]</sup>

A total of 66,860 males and 35,604 females with fractures were collected, males were more than females in each year, which was consistent with a previous study that more women with fractures over 60 years were than men.<sup>[4]</sup> The reason may be that male physical labor was more intense and stronger than females at work, and males have a weak sense of self-protection than females, moreover, estrogen exerts a protective effect on osteoporosis in women before menopause. Khosla reported sexual steroids, especially estrogen, play an important role in regulating bone metabolism and slow down age-related bone loss in both women and men.<sup>[5]</sup> With the gradual increase in age, women began to enter menopause, and men began to reduce the heavy physical labor, so the difference between male and female patients gradually reduced, and females were more than males at last.

In summary, the number of adult with fractures increased by year. The average age of adult with fractures increases by the year. Males with fracture were more than females

with a fracture. Hospital and the community should be more targeted in the planning of future fractures prevention and management according to these characteristics. However, due to the large sample size, this study did not focus on the cause of injury, which needed to be improved in the future study.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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