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Basic investigation into the present burn care system in China: Burn units, doctors, nurses, beds and special treatment equipment

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ABSTRACT

Objective: The aim of the study was to survey the current burn units in China to understand the burn care system in the country and supply basic data for the National Burn Repository of China (NBRC) and further research.
Method: A questionnaire was developed and sent to burn unit directors in China via e-mail, which was followed up with reminder text messages to obtain information for the study.
Results: Of the 405 hospitals from the 31 provinces in mainland China that responded to the questionnaire, 63.7% of the responses came from Grade 3A hospitals, and the most popular model of organisation was the Burns and Plastic Surgery arrangement (63.0%). An average of 9.43 ± 0.351 doctors work in each burn unit with 70.4% of all units having 4–11 doctors. The ratio of chief surgeon to associate chief surgeon to attending surgeon to resident surgeon and surgeon assistant was 1:1.8:2.2:2.3. An average of 30% of all doctors in each burn unit held postgraduate degrees, and more than 90% of all surgeons held a bachelor's degree or higher. There were 16.48 ± 0.637 nurses per burn unit, 56.5% of burn units had 8–15 nurses, and the ratio of chief nurse to associate chief nurse to supervisor nurse to nurse practitioner to junior nurse was 1:11.8:57.0:82.1:86.1. More than 80% of all nurses had received a college education or above. However, only 30% of nurses held bachelor's degrees or higher, while only 0.66% of nurses had received postgraduate degrees. A total of 39.91 ± 1.50 beds were available in each burn unit and 45% of burn units had 20–39 beds. Up to 70% of the total beds were prepared for patients with burn, and more than 10% of the beds were specifically for patients with severe burn. The ratios of doctors to nurses, beds to doctors, beds to nurses, and beds to doctors and nurses were 0.64 ± 0.01, 4.48 ± 0.12, 2.67 ± 0.09, and 1.66 ± 0.06, respectively. The workload of each doctor and nurse was most heavy in units with 40–59 beds. In addition, we estimated that there were 0.05, 0.5, 0.8, and 1.9 burn units, burn doctors, nurses, and beds, respectively, per 100,000 members of the population in mainland China. Chinese burn units lack special burn treatments, nursing equipment, and operation apparatuses.

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Conclusion: To the best of our knowledge, this is the first survey of the present burn care system in China. These results confirm that the burn care system is not equivalent to the national power of this country and the system lacks a great number of trained burn professionals. Burn doctors and nurses bear a heavy burden of work. This report supplies basic data to spur further research. We propose creating a burn unit registration system and a special database in China.

1. Introduction

Burns are the fourth most common type of injury and can cause severe damage. They can be an extremely disabling medical condition and can be associated with long-term physical and psychological problems for patients [1,2] as well as with financial burdens on their families and society. The World Health Organisation (WHO) estimates that the incidence of burns that required medical attention was nearly 11 million people globally in 2004 and that burns account for over 310,000 deaths each year. However, the burden of burns is unevenly distributed throughout the world. The incidence of burns requiring medical care is nearly 20 times higher in the Western Pacific region (including China) than in the Americas [3]. The occurrence of burns is closely related to the socioeconomic development of an area [4,5]. The vast majority of burn-related deaths (95%) occur in middle- or low-income countries [6] where prevention programmes are uncommon and the quality of acute care is inconsistent [7].

China's economy has become the second largest in the world, making it a middle-income country [8]. However, until now, there have been no official statistical data on the status of the burn care system in China. The First Plenary Session of the Standing Committee of the 8th Chinese Burn Association Committee on January 7–8 2012 in Shanghai launched a large-scale nationwide survey to understand the burn care system and establish the National Burn Repository of China (NBRC).

This study surveyed burn units nationwide, including the burn units themselves as well as the burn doctors, nurses, beds, and special treatment equipment, with the goal of providing data to the NBRC and future investigating parties.

2. Method

A contact list for 653 burn units and their directors was created according to information provided by the members of the 8th Chinese Burn Association Committee. Next, a questionnaire was developed to obtain information in the following areas: (1) basic information on burn units, geographic and communication information, organisational structure, hospital grade, and information about the director; (2) the number of doctors, their professional title, and their highest degree of education; (3) the number of nurses, their professional title, and their highest degree of education; (4) total number of beds as well as the number of each type of bed, e.g., for patients with ordinary burn, rescue beds for patients with severe burn, and orthopaedic beds; and (5) special burn treatment, care, and surgical facilities.

The questionnaire was e-mailed to the directors of the burn units on the contact list, and a reminder text message was sent within a month. For those who did not respond in the first month, a second e-mail reminding them of the form was sent. A total of six rounds of follow-up e-mails were sent over 8 months. Directors whose e-mails were not available on the contact list were contacted by phone to obtain their e-mail addresses, after which e-mail communication was as outlined above. Simultaneously, an EpiData database was established to collect information from the questionnaire answers. We used IBM SPSS Statistics software (version 19) for all analyses and the data presented in this article are provided as the mean ± SEM.

3. Results

3.1. Geographic distribution of burn units

Fig. 1a and Table 1 show the geographic distribution of burn units. Fig. 1b depicts the total burn units, including both the units that contributed and did not contribute to this survey in each province. A total of 405 completed questionnaires were received. All 31 provinces in mainland China have burn units, but the total number of units in each province differs. Specifically, the Henan Province contains 63 units, the most of any province, and Tibet contains the least units with only 1. The investigation rates also varied between provinces. Less than 50% of the units were investigated for four provinces, while 100% of units were investigated for five provinces. In total, 62% of all burn units were investigated.

3.2. Grade of hospitals

In accordance with the 'hospital grade management standards' issued by the Ministry of Health, hospital grading criteria are based on the hospital's function, facilities, technology level, size, management, medical quality, and other qualifications, regardless of its background, ownership, and so on. Following each review, each hospital was assigned a grade of A, B, or C, each of which was subdivided into three classes: 3A > 2A > A > 3B > 2B > B > 3C > 2C > C. In addition, hospital grading in China depends heavily on the service area. To understand this clearly, the Chinese administrative division and government level will be introduced. Five practical levels exist: 33 province-level divisions (not including Taiwan), 333 prefecture-level divisions, 2862 county-level divisions, 41,636 township-level divisions, and countless