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Clinical and investigative critical care medicine in Japan

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The structure, delivery of care, and outcomes of intensive care services vary widely, even among developed countries. While the services rendered by North American and Western European intensive care units (ICUs) have been described and compared [1], far less is known about these services provided in Asian countries. We briefly review the history and the national and regional organizations of ICU in Japan, with a view to describe the current state of critical care medicine, including research in the field, and discuss opportunities for improvements.

Overall organization of intensive care

Most, but not all, Japanese ICUs are funded by a public insurance system managed by the Ministry of Health, Labour and Welfare (MHLW), Japan. The system, created in 1978, currently distinguishes four different levels based on the intensity of care provided (including intensivists and medical engineers), the working space in each room, and the types of care delivered. The levels are

divided between (1) high- and low-intensity units and (2) burn and non-burn units; the units are consistently staffed to guarantee a patient-to-nurse ratio of at most 2. The 653 ICUs currently approved in Japan include a total of 5603 beds, of which 12 % are classified as high-intensity units [2014 MHLW data]. The number of the ICU beds per population (Fig. 1) is the lowest among developed countries after the UK [2], while the total number of hospital beds is the highest. Consequently, the proportion of ICU beds per hospital (0.6 % of all beds) is very low. This disproportion, which was observed in a 2002 study comparing Japan and the USA [3], has persisted despite the more than 50 % increase in the number of Japanese ICU beds since 2006 [2014 MHLW publication]. Furthermore, only 244 ICUs (approximately 40 % of all units) have been certified by the Japanese Society of Intensive Care Medicine (JSICM) for the delivery of subspecialty training. The program, launched in 1989, has certified 935 intensivists to date, of whom 69 % are also board-certified in anaesthesiology, 42 % in emergency

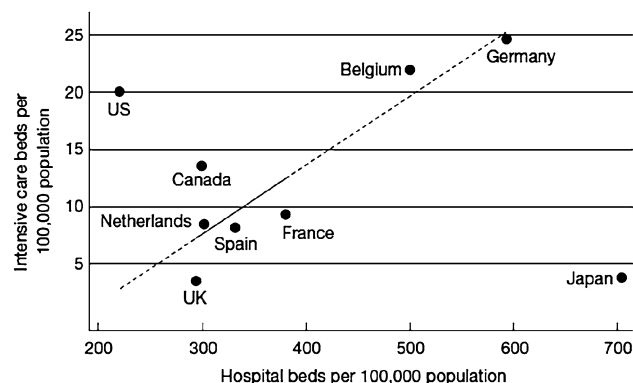


Fig. 1 Among developed countries, the overall number of hospital beds per population is greatest in Japan. In contrast, the number of ICU beds in Japan is remarkably small. Reprinted with permission from [2]

medicine, and 22 % in both specialties [4]. The uneven geographical distribution of ICUs and intensivists is approximately twofold higher in the Chugoku-Shikoku than in the Tohoku region. Finally, the overall median number of beds per ICU is 7, reaching 10 among the most advanced institutions [JSICM data].

Currently, the 29 existing paediatric ICUs contain 200 beds (a median of 8 beds per unit), representing approximately 42 % of the supply offered by other developed countries, calculated by the number of inhabitants younger than 15 years old [JSICM data]. In paediatric ICUs, 68 % of physicians are board-certified intensivists, and 38 % of the units are staffed by intensivists around the clock, 365 days/year [JSICM data]. There is no board certification for paediatric intensivists.

The low prevalence of ICU services in Japan may be due to a weak historical tradition, insufficient public and social awareness, and scarce governmental funding. Furthermore, the low number of trained intensivists might, in part, be due to an underdeveloped educational system. The medical specialty of “intensivist” is not officially acknowledged by MHLW, and intensive care services are reimbursed despite the absence of contributions by certified intensivists.

Critical care research

The Japanese contributions to research in the field of critical care medicine are considered insufficient. Although the mean impact factor of articles originating from Japan ranked second, behind Canada, the “total product” of research in a 1995–2003 worldwide survey, calculated by the number of articles published, multiplied by their impact factor, compared with the gross national products per capita, was strikingly low [5]. Moreover, in 2011, only 12 articles from Japan were published in 10 major critical care journals [6], occupying third place among the Asian countries. Remarkably, the number of articles published decreased from 48 in 2000, a 75 % decrease [6]. Furthermore, between 2006 and 2010, the three major core clinical journals (*New England Journal of Medicine*, *Lancet* and *Journal of the American Medical Association*) published only two articles in the field of critical care medicine from Japan [7]. This negative evolution is in contrast with the increase in the number of

publications originating from China, Taiwan and Korea, a trend observed similarly in other medical specialties [8]. A recent review reported that among 248 randomized trials published in the field of paediatric ICU medicine from inception to 16 April 2013, a single article originated from Japan, suggesting an even more troublesome weakness in that area of research [9]. Besides the language barrier, insufficient public or private scientific funding due to a stagnating economy in the last decade, combined with a scarcity of researchers in the field of intensive care medicine might be the cause of a low scientific research productivity.

Conclusions and future perspectives

The Japanese ICU services are in need of improvement. Sociopolitical movements must be promoted to raise the resources and funds needed to support the delivery of intensive care, drawing on the movements of globalization supported by government. Then, with an ultimate goal of leadership by intensivists, larger ICUs might be created to improve the outcomes of critically ill patients [10].

The JSICM has just begun offering (1) a board certification for intensivists within a new governmental program of medical doctor certifications, emulating the European CoBaTrICE program [11], (2) an educational program using parts of multiprofessional critical care review courses, and (3) a clinical trial group to promote multicentre, multinational studies [12]. The modernization of Japanese ICU services is absolutely necessary to (a) satisfy the needs of an aging society over the next few decades [13], (b) adapt the delivery of care to the constant progress of medicine [14], and (c) promote “evidence-based medicine” adapted to local clinical settings.

Intensive Care Medicine plays a clear role in highlighting the culture of critical care in Japan and is perceived as a most desirable target for the publication of Japanese research including issues discussed in this article [15].

Compliance with ethical standards

Conflicts of interest Dr. Shime has no potential conflict of interest to disclose.

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