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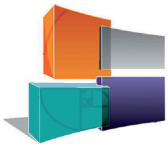

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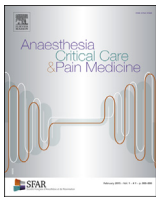

Original Article

In-hospital organization of primary care of patients presenting a life-threatening emergency: A French national survey in 32 university hospitals

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ABSTRACT

Introduction: The development of specialized units dedicated to life-threatening management has demonstrated to improve the prognosis of patients requiring such treatments. However, apart those focused on trauma and stroke, networks are still lacking in France. Despite, the implementation of standardisation of practices and guidelines, particularly in prehospital care, in-hospital clinical practices at admission remain heterogenous. This survey aimed to assess the structural and human organization of teaching hospitals in France concerning the primary in-hospital care for critically ill patients.
Material and method: A questionnaire of 45 items was sent by e-mail to 32 teaching hospitals between January and March 2013. It included information related to the description of the emergency department, of ICUs, and both structural and human organizations for primary in-hospital care of life-threatening patients.
Results: Seventy-five percent of teaching hospitals answered to the survey. Seven hundred to 1400 patients were admitted to emergency units per week and among them 10 to 20 were admitted for critically ill conditions. These latter were addressed in a specialized room of the emergency unit (*Service d'admission des urgences vitales* [SAUV]) in 40% of hospitals and in specialized room in ICU in 18% of cases. Intensivists were involved in 50% of hospitals, emergency physicians in 26% and it was mixed in 24% of hospitals.
Conclusion: This survey is the first to assess the in-hospital organization of primary care for instable and life-threatening patients in France. Our results confirmed the extreme heterogeneity of structural and human organizations for primary in-hospital care of patients presenting at least one organ failure. Thus, a consensus is probably needed to homogenize and improve our practices.

1. Introduction

Networks dedicated to the treatment of most severe patients were firstly implemented in USA in the middle of the seventies. This organization aims to hospitalize shortly the patient directly in the most appropriate structure including the technical and human skills. Such a concept, which was firstly and largely developed for trauma patients ("trauma center") [1], stroke ("stroke center") [2] and acute coronary syndrome ("coronary intensive care unit") [3], enables to optimize the management and

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improve the prognosis of these patients. These networks progressively develop in France (trauma network "TRENAU" in Annecy, PACA network...). Their impact on mortality has been recently reported for the TRENAU network, which is focused on the management of pelvic trauma [3]. The authors have shown that a rapid primary orientation of these patients directly in the reference center of the region was associated with a 15% reduction of the predictive mortality.

Despite substantial progress concerning the prehospital management in France, the primary in-hospital management of life-threatening patients (vital emergencies, with organ failures) remains strongly heterogenous, essentially because of structural conditions and old persistent habits. In 2004, the French society of emergency medicine (*Société francophone de médecine d'urgence* [SFMU]), the French prehospital emergency medicine (*Service d'aide médicale d'urgence* [Samu]) and the French society of anaesthesiology and intensive care medicine (*Société française d'anesthésie et de réanimation* [Sfar]) have published recommendations defining the human and structural needs required for the reception of life threatening patients inside an emergency service (*salle d'accueil des urgences vitales* [SAUV]) [4]. Nevertheless, the organization of these structures remains heterogenous, in terms of localisation, which can be a SAUV inside the emergency service or a special room inside the intensive care unit (ICU) or inside the post-interventional recovery room. Heterogeneity concerns also the physician's speciality and expertise, which can be an emergency physician, an anaesthesiologist-intensivist, or a medical intensivist.

Consequently, the aim of this prospective national survey was to assess the organization of the French university hospitals, which are in charge of the primary reception of patients presenting at least one organ failure.

2. Material and methods

This is a prospective survey performed between January and March 2013 in French university hospitals receiving life-threatening patients. Thirty-two university hospitals are present in France, with the 3 most important cities of Paris, Marseille and Lyon, which include several hospitals. Data were collected using an electronic questionnaire (Appendix A), which was sent online to the physician responsible of each listed intensive care unit.

The questionnaire included items focused essentially on structural and human organization for the management of primary life-threatening patients. These latter were defined as those presenting one or more organ failures or physiological failures leading to a rapid risk of death. Collected data were:

- description of the ICU (number of beds, number of admission per year);
- description of the organization to manage the life-threatening patients including the localisation in the hospital, the specialty of the physicians, the role of residents and juniors, the prehospital criteria for the orientation of the patient;
- description of the network organization including the closeness of ICU, operative room, imaging structure (echography, CT-scan), interventional treating rooms required for percutaneous artery embolisation and coronarography artery revascularisation;
- global satisfaction of physicians concerning the organization of their structure and proposed improvements.

Answers were automatically collected online on Excel® software (Microsoft, Santa Rosa, CA). Results are expressed in absolute values (percentage) and mean ± SD as appropriate.

3. Results

Seventy-five percent of the eligible ICUs answered the questionnaire (24/32 among which 4 ICUs from Paris, 3 from Marseille and 3 from Lyon). Fourteen (58%) of the contacted ICUs were classified in the level I (reference centre) and level II (centre including a high technical expertise) [5] for receiving polytrauma, and 12 (52%) were in agreement with the criteria of a stroke centre [6]. The prehospital guidance criteria towards a receiving structure in charge of life-threatening patients were highly variable among centers and hospitals (Table 1).

Emergency units received a mean of 700 to 1400 patients per week for 15 (62%) of units, more than 1400 and less than 700 patients per week for 7 (28%) and 2 (10%) units, respectively. Among them, the number of patients admitted with a life-threatening condition was of 10 to 20 patients in 12 (50%) units, less than 10 and more than 20 patients in 8 (33%) and 4 (17%) units, respectively (Table 2). In ICUs, the number of beds was of 24 ± 11 and the number of admission per year was of 900 ± 12 patients.

In 13 (52%) of hospitals, the initial admission of life-threatening patients was possible in 2 distinct units that were clearly located in 2 different areas, i.e. the emergency unit or the ICU. In detail, the structural organization of hospitals for the admission of these patients was distributed as follows: 10 (40%) in the dedicated SAUV located inside the emergency service, 4 (18%) in a dedicated room located inside the ICU, 1 (4%) in a non-dedicated room of the emergency service, 2 (8%) directly in the operative room, in another structure for the 3 (10%) hospitals (Fig. 1). Those structures (regardless their localisation in the hospital) were immediately nearby (same building and same floor) from the interventional radiologic room in 8 (35%) of hospitals and from the operative room in 11 (48%) of hospitals. The proportion of main medical and surgical specialities involved in critically ill patients inside the same hospital was variable: 10 (42%) for cardiac surgery, 13 (55%) for coronary artery arteriography, 15 (61%) for neurosurgery, 13 (52%) for thoracic surgery, 13 (52%) for vascular surgery, 22 (90%) for digestive surgery, 12 (48%) for obstetrical procedures, 15 (61%) for urology, and 15 (61%) for ophthalmology. The specialists-physicians could be reached in 20 (84%) of hospitals, but a real formalized network was efficient in only 11 (45%) structures.

Life-threatening patients were managed by emergency physicians in 6 (26%) cases, by anaesthesiologists-intensivists or medical intensivists in 12 (50%) cases and by both in 6 (24%) cases (Fig. 2).

Table 1
Orientation criteria in dedicated unit for life threatening patients.

Prehospital orientation criteria	Centers *n* (%)
Intubation	20 (65%)
Systolic blood pressure < 90 mmHg or fluid expansion	20 (65%)
Glasgow score < 9	19 (61%)
Catecholamine use	18 (58%)
SaO_2 < 95 % under oxygen therapy	13 (42%)
Burn > 2° or > 15 %	11 (35%)
Others	5 (16%)
Glasgow Score < 15	3 (10%)
Trauma patients	
High speed trauma	17 (89%)
Penetrating Heart trauma	17 (89%)
Amputation	15 (79%)
Penetrating trauma	14 (74%)
Pelvic trauma	13 (68%)
Thoracic flail	10 (53%)
Spine trauma	10 (53%)
Femur trauma	9 (47%)