

The globalization of emergency medicine and its importance for public health

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Abstract Emergency medicine (EM) is a global discipline that provides secondary disease prevention and is also a tool for primary prevention. It is a horizontally integrated system of emergency care consisting of access to EM care; provision of EM care in the community and during transportation of patients; and provision of care at the receiving facility or hospital emergency department.

EM can offer many tools to improve public health. These tools include primary disease prevention; interventions for addressing substance abuse and interpersonal violence; education about safety practices; epidemiological surveillance; enrolment of patients in clinical research trials focusing on acute interventions; education and clinical training of health-care providers; and participation in local and regional responses to natural and man-made disasters.

Public health advocates and health policy-makers can benefit from the opportunities of EM and can help overcome its challenges. Advocating the establishment and recognition of the specialty of EM worldwide can result in benefits for health-care education, help in incorporating the full scope of EM care into the system of public health, and expand the capabilities of EM for primary and secondary prevention for the benefit of the health of the public.

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يمكن الاطلاع على الملخص بالعربية في صفحة 839.

Introduction

Primary prevention can mitigate traditional global public health problems such as disease and malnutrition.¹ However, primary prevention is not always applied, and not all acute illnesses and injuries can be prevented even with the most strenuous of efforts. Urbanization, mechanization, local violence and regional conflicts have resulted in an increase in morbidity and mortality from trauma, especially among the young.¹ People are living longer, with associated increases in chronic cardiac, respiratory and vascular diseases.² Contemporary society is faced with new and different challenges, requiring new strategies for primary and secondary prevention.

Emergency medicine (EM) is a global discipline that functions as a cornerstone for secondary disease prevention and is one of many tools for implementing primary disease prevention

programmes. Many core EM interventions are simple and effective,³⁻⁵ and an episode of emergency care can also be used to facilitate primary prevention. Effective and sustained EM concepts and practices can improve the public health of countries at all levels of socioeconomic development.

This article describes the evolution of EM into a global medical discipline, outlines the components of emergency medical care and its delivery, summarizes the contributions EM can make to public health, and describes some of the challenges and opportunities for improving EM care worldwide.

Evolution of emergency medicine as a global discipline

Providing emergency medical care is as old as the practice of medicine itself, but the discipline of EM and the development of integrated systems of

emergency care delivery are more recent phenomena.

Prior to the 1960s, emergency medical care was a weak link in the chain of health care delivery worldwide.^{6,7} No integrated systems of EM care existed. Prehospital care (where available at all) consisted of little more than rapid transport to hospitals. No specific training programmes in emergency care were available for physicians and nurses. There were no organizations dedicated to providing high quality EM care and to advancing the science and art of its delivery. The responsibility for staffing hospital emergency departments was distributed among physicians regardless of their specialization or level of training. Many physicians perceived emergency duty as an unwelcome burden and an interruption of their career paths. Needless to say, the emergency care available during this time was erratic, outcomes

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for patients often dismal, and the benefit to public health, minimal.

During the 1960s efforts to organize and improve EM care delivery began with simultaneous grass-roots movements in developed countries, with traditionally trained internal medicine specialists, surgeons and family practitioners assuming leadership roles in developing systems to ensure optimal care for all patients with medical emergencies. This came at a time when rapid advances in technology, diagnostics and therapeutics provided better opportunities for recognizing and treating medical emergencies. Horizontally integrated emergency care systems began to be developed in response to vertically integrated systems of specialty care. Such vertically integrated systems were “silos” (independent, closed domains or functions without linkage of administrative, cognitive or technical skills to other specialties) that created problems of access to appropriate care for patients with as yet undiagnosed medical emergencies, or for patients with complex medical emergencies that cut across traditional specialty boundaries. At the same time, early EM pioneers in several countries began developing training programmes for physicians interested in this field. Growing public concerns about poor EM care infrastructure resulted in political pressure to fund programmes for developing integrated EM care delivery systems.

Forty years on, EM has evolved into a coherent discipline: a unique set of cognitive, administrative and technical skills for managing all types of patients with acute illness or injury, regardless of age or gender.⁸ This modern approach to EM care is “horizontally integrated” in that it combines knowledge and skills traditionally associated with multiple specialties together with the new knowledge and skills necessary for prompt and effective management of emergency patients.

One measure of the degree of globalization of EM is that there are now more than 30 professional and scientific publications related to EM worldwide. At the time of writing, 46 countries have recognized EM as an official medical specialty (see Table 1; web version only, <http://www.who.int/bulletin>).^{9–11} Delivery of EM care today is largely coordinated through integrated systems that facilitate continuity of emergency care from the community, through pre-hospital care systems, and into hospital emergency departments. These systems

are specifically designed to minimize morbidity, mortality and disability from acute illness and injury to the greatest extent possible, given available local resources. EM care delivery systems have come to represent a cornerstone of secondary disease prevention in modern health-care systems.

Components of EM care and delivery systems

The core concepts and strategies of EM care require focused medical decision-making and action with the goal of preventing needless death or disability from time-sensitive disease processes (i.e. conditions that must be treated within a certain time period to prevent or minimize mortality or morbidity). EM care has the following components: accessing care, care in the community, care during transportation, and care on arrival at a receiving facility.¹²

Accessing EM care

Medical emergencies are time sensitive, because the longer the time that elapses before recognition and treatment, the greater the likelihood of morbidity, mortality or disability. Accessing EM care should therefore be made easy. Delays in accessing care can be reduced through public education about how and when to seek EM care. A universal emergency telephone access number can simplify access — a single telephone number connects the caller to a dispatch system for prehospital care services. In many countries, access to public safety, police and fire services is also integrated with access to prehospital care.

EM care in the community

With appropriate training, bystanders, community health workers, nurses, primary care physicians and other health-care providers can provide effective EM care in the community. Educational programmes in first aid, cardiopulmonary resuscitation, management of foreign bodies in the airways, control of external haemorrhage and immobilization of injured extremities using local materials, can ensure an immediate, basic level of EM care where there are no prehospital systems, or before providers of prehospital care arrive.

EM care during transportation

Systems for transporting patients with medical emergencies to health care fa-

cilities are another essential component for reducing morbidity and mortality. Communication systems allow providers of prehospital care to notify receiving facilities before a patient arrives, and to obtain medical consultation during transport. The extent to which prehospital care systems provide EM care en route varies considerably from country to country and depends on many factors including socioeconomics, local traditions and legislation.^{5,12,13} System approaches range from those that provide only transportation; those that provide a basic level of care (first aid); those providing an advanced level of care by paramedics, nurses or physicians; to those that provide treatment in the ambulance and release patients from care without transport. EM physicians play important roles in supervising prehospital care systems, training prehospital care providers and providing prehospital care themselves.

EM care on arrival at a receiving facility

Once a patient arrives at the emergency department (ED), the care process consists of the following components: triage; resuscitation and stabilization; establishment of a preliminary diagnosis and providing treatment; observation and consultation; communication of results and documentation of care; and making provisions for follow-up care.^{12,14,15}

When a specific in-hospital intervention is available and indicated, patients may be brought by the prehospital care team directly to an inpatient specialty unit. For example, unstable patients with penetrating trauma may be taken directly to the operating suite, or patients with an acute ST-elevation myocardial infarction may be taken directly to the cardiac catheterization laboratory. However, the more common practice is to provide emergency care in a hospital ED.

Triage is necessary to identify those who need immediate care and those who may deteriorate; to prioritize care for the remaining patients; and to distribute finite resources in the best way. Since patients may use the ED for convenience and for self-defined emergencies, pre-established triage guidelines or algorithms help identify those most in need of immediate care and can minimize morbidity.¹² ED triage is usually performed by specially trained nurses.

Resuscitation is the process of recognizing life-threatening dysfunction

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and restoring critical organ function. Emergency physicians have the knowledge, skills and experience in areas such as airway management, volume and blood replacement, containment of acute haemorrhage, paediatric and obstetric resuscitation, and mastery of the therapies for acute myocardial infarction, cardiac arrhythmias and stroke.^{14,15} Other specialists may possess the knowledge, skill and experience to provide emergency care for patients with problems in their specialty domain. However, it is neither practical nor cost-effective to staff hospital EDs around the clock with the range of specialists necessary to provide initial emergency care for all types of patients when EM physicians are able to play this role effectively.

The majority of patients who seek emergency care present with complaints or symptoms but not diagnoses. Triage prioritizes patients and enables the timeliest evaluation to establish a preliminary diagnosis and institute treatment.

If initial diagnostic and therapeutic measures are inconclusive, observation and/or consultation with another specialist may be indicated. It is also necessary to communicate results to other physicians and the patient, document the care given, and make provisions for follow-up care. The emergency phase of care is concluded once the patient is admitted, discharged or transferred to a higher level of care.

The roles of EM in public health

In addition to the central public health role played by clinical EM care systems in secondary disease prevention, EM care systems and EM physicians are also important for primary prevention. EDs provide primary interventions such as vaccination against diphtheria, tetanus and pertussis; post-exposure prophylaxis for diseases such as rabies and hepatitis; and identification of asymptomatic hypertension during routine assessment of vital signs. EM physicians provide targeted crisis intervention and referral for conditions such as substance abuse, depression and interpersonal violence,¹⁶ as well as education about use of helmets and seat-belts. EM physicians can also serve as powerful advocates for social change by lobbying for legislation for injury prevention.

EDs are sources of data for population-based epidemiological surveillance.^{17,18} ED data systems capture clinical and administrative information not

only on patients who are hospitalized, but from the even larger numbers of patients discharged from the ED who are never hospitalized.

EDs are also important sites for enrolling patients in clinical research trials which focus on acute interventions. Examples include studies on acute stroke, acute myocardial infarction, acute asthma and acute seizures.

The concentration of illness found in an ED makes it an ideal setting for training health care providers. EDs in teaching hospitals are desirable sites for teaching and training. In less developed countries, EM physicians can provide education and training for community health-care providers, who may provide much of the EM care for the population.^{5,7}

National and international systems for response to disasters invariably require time to mobilize and deploy, and are rarely operational until several days after the event. As a result, the responsibility for the initial medical response to a disaster will fall on local EM systems and care providers.¹⁹ The global outbreak of severe acute respiratory syndrome (SARS)¹⁷ demonstrated the importance of EM systems and EDs for early identification and management of the disease. Much work certainly remains to be done to optimize disaster response capacities worldwide; however the central role of robust EM systems and care providers in effective disaster planning and response has never been clearer.

Challenges and opportunities for global development of EM care systems

Education and training

The principles and concepts of EM are underrepresented in or absent from the curricula of many medical schools around the world. The traditional setting for clinical education of medical students is on the inpatient wards of tertiary care hospitals where the emphasis is placed on making the right diagnosis, not on the recognition and management of medical emergencies.¹² Health care providers from countries without postgraduate residency programmes in EM, or without a critical mass of EM-trained providers, may not have access to training in emergency care. Steps that can be taken by health-care policy-makers and decision-makers to improve education

and training opportunities in EM within a given country or region include:

- encouraging local universities to introduce EM concepts into the undergraduate medical curriculum;
- supporting efforts to start programmes for training postgraduate physicians in EM; and
- supporting efforts to introduce EM courses for physicians and nurses in the community.

Recruitment of talented individuals

In countries where EM is not an officially recognized specialty, there is a relative disincentive for talented individuals to choose EM as a career, because they will be unable to attain positions of academic, clinical and administrative authority. Talented individuals from under-developed countries who go abroad to train in EM have little incentive to return home if there is no opportunity for advancement. By supporting or introducing initiatives to adopt EM as an official specialty, health-care policy-makers can help create incentives that will attract talented individuals to EM and retain them, who will in turn drive the improvement of local delivery of EM care.

Understanding the role of EM

Misconceptions about the role of EM may stem from outdated views or lack of familiarity with current EM systems and practice. Whatever their source, these misconceptions limit the extent to which health care systems and the public may benefit from EM systems and care providers by hindering their development and implementation.

One misconception is that the EM care system is only for the care of patients with known life-threatening emergencies and that all other patients are managed by the primary care system. Rapid determination of which patients have true or potential emergencies is not a uniformly simple task. To minimize delays in recognition and treatment, the functions for triage and resuscitation must be tightly integrated within the health care system.

Another misconception is that EM care systems are focused only on the care of patients with injuries and that those with medical emergencies are cared for by other segments of the health care system. By narrowly focusing on trauma care, health system planners overlook significant opportunities for efficiently

using resources and optimizing the quality of emergency care.

A third misconception is that EM care takes place primarily in the prehospital setting. Prehospital care is an important element of the continuum of EM care, but hospital EDs can treat far greater numbers of emergency patients. In the majority of countries at all levels of socioeconomic development, emergency care is delivered primarily in a hospital-based ED rather than in the prehospital setting.⁹

By working with national and international EM professional organizations, health-care policy-makers and public health organizations can promote the creation of guidelines for the development of EM care systems that take full advantage of the potential of EM for serving public health. Public health organizations are encouraged to study and track the development and effects of EM care systems to better understand their role and potential for promoting public health.

Administration of systems for the delivery of EM care

In many countries it is common for the different components of EM care systems to be organized, operated, and funded by different government ministries or agencies. For example, the alarm and dispatch functions may be controlled by the police (ministry of justice); prehospital care functions may be controlled by the fire department (ministry of interior); and hospital EDs may be controlled by the ministry of health. For EM care to be effective and efficient, all of these elements need to work in close coordination, which necessitates a common understanding of the mission and operational strategies at all organizational levels, and cooperation at the leadership level. By advocating system-based delivery of EM care as a core public health function, health care policy-makers and public health officials can promote functional relationships between different

elements of the EM care system. Specific initiatives can include the requirement of medical leadership for all elements of the EM care delivery system as well as designating a lead agency to coordinate interagency activities.

Conclusion

We have presented the global discipline of EM from a public health perspective to explain how it provides primary and secondary disease prevention. EM care systems are potent public health tools for reducing morbidity and mortality from acute illness and injury, for disaster response, epidemiological surveillance and selected preventive health functions. There remain, however, several challenges and opportunities for health care policy-makers and public health advocates to improve EM care for the benefit of the health of the public. ■

Competing interests: none declared.

Résumé

Mondialisation de la médecine d'urgence et importance de ce phénomène pour la santé publique

La médecine d'urgence est une discipline mondiale, qui assure une prévention des pathologies secondaires et constitue également un outil de prévention primaire. C'est un système intégré horizontalement de soins d'urgence comprenant : l'accès aux soins, la dispensation de soins de médecine d'urgence au sein de la collectivité et pendant le transport des patients, ainsi que la dispensation de soins dans l'unité ou le service d'urgence.

La médecine d'urgence peut fournir nombre d'outils pour améliorer la santé publique, parmi lesquels la prévention des pathologies primaires, les interventions pour faire face aux abus de substances et aux violences interpersonnelles, la formation et l'entraînement cliniques des prestataires de soins et la participation

aux réponses locales et régionales aux catastrophes d'origine naturelle et humaine.

Les défenseurs de la santé publique et les décideurs dans ce domaine peuvent tirer parti des possibilités offertes par la médecine d'urgence et aider à surmonter les difficultés qu'elle rencontre. Promouvoir dans le monde entier la mise en place et la reconnaissance de la médecine d'urgence en tant que spécialité médicale peut bénéficier à la formation aux soins de santé, contribuer à l'incorporation de l'éventail complet des soins de cette spécialité dans le système de santé publique et étendre ses capacités de prévention primaire et secondaire au profit de la santé des populations.

Resumen

La mundialización de la medicina de emergencia y su importancia para la salud pública

La medicina de emergencia (ME) es una disciplina mundial que contempla la prevención secundaria de enfermedades y se utiliza también como instrumento de prevención primaria. Es un sistema de atención de emergencia integrado horizontalmente que abarca la atención ME; el suministro de servicios de ME en la comunidad y durante el transporte de pacientes; y el suministro de atención en el centro receptor o el servicio de urgencias del hospital.

La ME ofrece numerosas herramientas para mejorar la salud pública. Entre ellas cabe citar la prevención primaria; las intervenciones destinadas a combatir el abuso de sustancias y la violencia interpersonal; la educación sobre las prácticas de seguridad; la vigilancia epidemiológica; el reclutamiento de pacientes para ensayos de investigación clínica centrados

en intervenciones agudas; la educación y formación clínica de dispensadores de atención sanitaria; y la participación en las respuestas locales y regionales a los desastres naturales o causados por el hombre.

Los defensores de la salud pública y los responsables políticos pueden beneficiarse de las posibilidades que brinda la ME y ayudar a superar los retos que plantea. Preconizando el establecimiento y reconocimiento de la especialidad de ME en todo el mundo se puede contribuir a mejorar la enseñanza de la atención sanitaria, propiciar la incorporación de todo el espectro de medidas de ME en el sistema de salud pública, y ampliar las opciones de la ME para la prevención primaria y secundaria en beneficio de la salud de la población.

ملخص

عَوْلْمَةُ طَب الطَوَارِئِ وَأَهْمِيَّتِهَا لِلصَّحَّةِ العَمُومِيَّةِ

سريرياً (إكلينيكيًا)، والمساهمة في الاستجابات للكوارث الطبيعية والكوارث التي يقترفها الناس، على الصعيد المحلي وعلى الصعيد الإقليمي. تدعو الصحة العمومية لاغتنام الفرص التي يوفرها طب الطوارئ، والتي يمكن لأصحاب القرار السياسي الاستفادة منها، والتي يمكن أن تساعد في التغلب على التحديات. إن الدعوة لترسيخ طب الطوارئ والاعتراف به في جميع أرجاء المعمورة يمكن أن يؤدي لمنافع جمة في التثقيف حول الرعاية الصحية، ويمكن أن يساعد في إدماج النطاق الواسع للرعاية في طب الطوارئ ضمن نطاق الصحة العمومية، كما يمكن أن يوسع من الإمكانيات التي يتمتع بها طب الطوارئ في الوقاية الأولية والثانوية لصالح الصحة العمومية.

طب الطوارئ نظام عالمي يوفر الوقاية الثانوية من الأمراض، وهو أيضاً من أدوات الوقاية الأولية. وهو نظام أفقي التكامل للرعاية أثناء الطوارئ، يتألف من إتاحة الرعاية في طب الطوارئ، وتقديمها في المجتمع وأثناء نقل المرضى، وفي مرافق استقبال المرضى أو في أقسام الطوارئ في المستشفيات. ويمكن لطب الطوارئ أن يقدم الكثير من الأدوات لتحسين الصحة العمومية، ومن هذه الأدوات الوقاية الأولية من الأمراض، والتدخلات لمواجهة تعاطي مواد الإدمان ولواجهة العنف بين الأشخاص، والتثقيف حول الممارسات المحفوفة بالسلامة، والترصد الإبيديميولوجي (الوبائي)، وإدراج المرضى ضمن دراسات البحوث السريرية (الإكلينيكية) التي تركز على التدخلات الحادة، وتثقيف القائمين على إيتاء الرعاية الصحية وتدريبهم

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