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The clinical practice of emergency medicine in Mahajanga, Madagascar

La pratique clinique de la médecine d'urgence à Mahajanga, Madagascar

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Introduction: Little is documented concerning the clinical practice of emergency care in low- and middle-income countries. The lack of structural models presents serious obstacles to the development of effective emergency care services. This study provides such a model by describing the clinical practice at the emergency centre of the Centre Hôpitalier Universitaire de Mahajanga in Madagascar.
Methods: This was a retrospective chart review of all adult patients presenting to the emergency centre from September to November 2012. Archived chart data were extracted into a computer database. Data included: age, sex, date, diagnostic investigations, procedures, medications, and diagnosis.
Results: 727 charts were reviewed, averaging eight patients per day. The three most frequent pathologies observed were trauma, gastrointestinal, and infectious disease. A total of 392 received diagnostic investigations. These were chiefly complete blood counts (n = 218), blood glucose (n = 155) and ECG (n = 92). Chest X-rays (n = 83), extremity X-rays (n = 55) and skull/face X-rays (n = 44) comprised the most common imaging. Ultrasounds were primarily abdominal (n = 9), renal/genitourinary (n = 6), and obstetric (n = 2). Therapeutic interventions were performed in 564 patients, most commonly intravenous access (n = 452) and wound/orthopaedic care (n = 185). Medications were administered to 568 patients, mostly anti-inflammatory/analgesics (n = 463) and antibiotics (n = 287).
Conclusion: This is the first descriptive study of the clinical practice of emergency medicine in Mahajanga, Madagascar. It provides both the Malagasy and international medical communities with an objective analysis of the practice of emergency care in Madagascar from both diagnostic and therapeutic standpoints. Emergency care here focuses on the management of traumatic injury and infectious disease. The diagnostic imaging, pharmacologic and procedural therapeutic interventions reflect the burdens placed upon this institution by these diseases. We hope this study will provide guidance for the further development of Malagasy-specific emergency care systems.

Introduction: La pratique clinique des soins d'urgence dans les pays à revenu faible et intermédiaire est peu documentée. L'absence de modèles structurels pose de sérieux obstacles au développement de services de soins d'urgence efficaces. Cette étude propose un tel modèle en décrivant la pratique clinique au centre d'urgence du Centre Hospitalier Universitaire de Mahajanga, à Madagascar.
Méthodes: Il s'agit ici d'un examen rétrospectif des dossiers de tous les patients adultes s'étant présentés au centre d'urgence de septembre à novembre 2012. Des données tirées de dossiers archivés ont été extraites et saisies dans une base de données informatique. Il s'agissait notamment de: l'âge, le sexe, la date, les enquêtes de diagnostic, les procédures, les médicaments et le diagnostic.
Résultats: 727 dossiers ont été examinés, soit en moyenne huit patients par jour. Les trois pathologies les plus fréquemment observées étaient les traumatismes ainsi que les maladies gastro-intestinales et infectieuses. Un total de 392 dossiers avaient fait l'objet d'enquêtes de diagnostic. Elles portaient principalement sur la numération et formule sanguine (n = 218), la glycémie (n = 155) et l'ECG (n = 92). Les types d'imageries les plus courantes étaient les radiographies du thorax (n = 83), les radiographies des extrémités (n = 55) et les radiographies du crâne et du massif facial (n = 44). Les échographies étaient principalement abdominales (n = 9), rénales/génito-urinaires (n = 6) et obstétricales (n = 2). Des interventions thérapeutiques ont été effectuées chez 564 patients; il s'agissait le plus souvent d'une perfusion intraveineuse (n = 452) et du traitements de plaies/orthopédiques (n = 185). Des médicaments ont été administrés à 568 patients, pour la plupart des anti-inflammatoires/analgésiques (n = 463) et des antibiotiques (n = 287).
Conclusion: Il s'agit de la première étude descriptive de la pratique clinique en médecine d'urgence à Mahajanga, Madagascar. Elle fournit à la communauté malgache et à la communauté médicale internationale une analyse objective de la pratique des soins d'urgence à Madagascar du point de vue diagnostique comme du point de vue thérapeutique. Les soins d'urgence se concentrent ici sur la gestion des lésions traumatiques et des maladies infectieuses. L'imagerie diagnostique, les interventions thérapeutiques pharmacologiques et de procédure reflètent les charges que représentent ces maladies sur cette institution. Nous espérons que cette étude fournira des orientations pour la poursuite du développement de systèmes de soins d'urgence propres au contexte malgache.

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African relevance

- This is a description of a tertiary emergency care system in northern Madagascar.
- We describe diagnostic and therapeutic practice trends in this setting.
- This information may be used to guide and develop future emergency care systems there.

Introduction

Little is documented concerning the actual clinical practice of emergency care in low- and middle-income countries. Gaps in knowledge regarding emergency care in these regions should be filled so that future systems can be based on credible evidence.[1] The lack of structural models presents serious obstacles to the development of effective emergency care services.[2]

More than 20 million residents collectively known as the Malagasy people inhabit the Republic of Madagascar. Seventy per cent of the Malagasy live in rural areas. The life expectancy at birth is 63 years for males and 67 years for females, and the median age is 18 years. As of 2002, there were 5201 physicians in Madagascar, with a density of 0.291 physicians per 1000, compared to an average of 0.217 per 1000 for the AFRO region, and 5661 nurses for a density of 0.316 per 1000, compared to a regional average of 1.172 per 1000.[3]

The Centre Hôpitalier Universitaire de Mahajanga has a relatively low volume of patients (approximately eight per day) for a tertiary referral hospital with an estimated catchment population of over 500,000 (using the current population of the Boeny region). This likely reflects the substantial barriers to accessing healthcare facilities in this region.[4] Potential contributing factors include transport barriers, financial burden, and social barriers. There is extremely poor access to pre-hospital transport in the region. Urban emergency medical systems (EMS) service areas with a radius of 100 km^2 on average and rural EMS a much smaller 25 km^2. Given that the catchment area of the Boeny region is over 31,000 km^2 and 70% of the population lives in rural settings, physically arriving at the Centre Hôpitalier Universitaire de Mahajanga is an ordeal.[5] A second barrier to access is financing. The average yearly household income in Madagascar is $440 USD, and as an example the cost of a single ambulance service to the Centre Hôpitalier Universitaire de Mahajanga is $5.50 USD, or 1.3% of a household's yearly salary.[6] Finally, religious taboos and beliefs regarding the use of western medicine lead many to instead seek access from traditional healers.[5]

This study describes the clinical practice at the emergency centre of the Centre Hôpitalier Universitaire de Mahajanga. It was reviewed and approved by the Institutional Review Committee of Research at the Centre Hôpitalier Universitaire de Mahajanga, and exempted from review by the Committee on Human Research at the University of California, San Francisco.

Methods

This study was performed in the Unité des Urgences et Soins Intensifs (literally, the Emergency and Intensive Care Unit) in the Centre Hôpitalier de Mahajanga. This hospital is located in Mahajanga, the capital of Boeny region. It is a seaport town with a population of 135,660 according to a 2001 estimate by the Institut National de la Statistique (INSTAT). It is the only tertiary referral hospital in the region and has 400 beds. The emergency centre functions as both a primary and tertiary referral centre; patients may self-present, be referred from clinics, or be brought in by the fire department's ambulance- the only public emergency medical service (EMS) vehicle in the region.

An on-call attendee, a resident, a senior medical student, and a junior medical student staff this unit. Patients are triaged at the point of entry by the on-call resident to either the medical or surgical side of the emergency centre. Paediatric patients less than five years of age are predominantly directed to a separate paediatric emergency centre.

This was a retrospective study of patient charts from all patients presenting during September, October and November of 2012. All patients presenting to the emergency centre's medical and surgical wings were included. For unknown reasons, there was a small group of paediatric patients that presented to the adult medical and surgical wings of the emergency centre, and not to the paediatric emergency centre. These patients were included in this group in our demographics table for faithful site-specific characterisation, but excluded from further analysis.

Archived charts were systematically reviewed, and data extracted by the principal investigator and entered into a computer database. Data were anonymised and de-identified upon entry. Only one physician abstracted data in order to maintain consistency. Data collected included: age, sex, date and time of entry, diagnostic investigations, procedures performed, medications given, and diagnosis (classified physiologically). Clinical charts at the Centre Hôpitalier Universitaire de Mahajanga are hand-written onto a preformed template that has designated areas for entry, time of administration of medications, and results of laboratory investigations. With data being recorded in this fashion, there was no possibility of recording orders that were written on the chart but not executed. There was however no possibility to reconcile for orders that may have been executed without having been written on the chart.

The final diagnosis from each chart was entered into one of 16 physiologic categories. This included a free-text section for "Other" that allowed for recording unanticipated categories that appeared with high frequency. The categories were comparable to several similar studies from the region.[7–9]

All charts were included in this study. Data were entered into an OpenOffice Base database and analysed using Microsoft Excel and OpenOffice Calc spreadsheets. Age, sex, and date and time of entry were entered directly into the database. Each diagnostic examination, procedure performed, medication given, and diagnosis was given a separate checkbox and logged in binary fashion, to reduce misclassification error.

Results

Data were collected for 727 patients. This represented every documented patient visit during the study period. The total number of charts was checked against the intake registry and found to be complete.

The median age of male patients was 33, females 30.5, and the overall median age was 32 (Table 1). The most represented