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CONFORMITY TO THE SURVIVING SEPSIS CAMPAIGN INTERNATIONAL GUIDELINES AMONG PHYSICIANS IN A GENERAL INTENSIVE CARE UNIT IN NAIROBI

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V. MUNG'AYI and R. KARUGA

ABSTRACT

Background: There are emerging therapies for managing septic critically-ill patients. There is little data from the developing world on their usage.

Objectives: To determine the conformity rate for resuscitation and management bundles for septic patients amongst physicians in a general intensive care unit.

Design: Cross sectional observational study.

Setting: The general intensive care unit, Aga Khan University Hospital, Nairobi.

Subjects: Admitting physicians from all specialties in the general intensive care unit.

Results: The physicians had high conformity rates of 92% and 96% for the fluid resuscitation and use of vaso pressors respectively for the initial resuscitation bundle. They had moderate conformity rates for blood cultures prior to administering antibiotics (57%) and administration of antibiotics within first hour of recognition of septic shock (54%). There was high conformity rate to the glucose control policy (81%), use of protective lung strategy in acute lung injury/Acute respiratory distress syndrome, venous thromboembolism prophylaxis (100%) and stress ulcer prophylaxis (100%) in the management bundle. Conformity was moderate for use of sedation, analgesia and muscle relaxant policy (69%), continuous renal replacement therapies (54%) and low for steroid policy (35%), administration of drotrecogin alfa (0%) and selective digestive decontamination (15%).

Conclusion: There is varying conformity to the international sepsis guidelines among physicians caring for patients in our general ICU. Since increased conformity would improve survival and reduce morbidity, there is need for sustained education and guideline based performance improvement.

INTRODUCTION

Sepsis is a systemic inflammatory response to presumed or known infection (1). Severe sepsis accounts for up to 20% of all admissions to intensive care units (ICUs) and is the leading cause of death in non-cardiac ICUs (2).

It is a leading cause of in-hospital death in adult patients and the incidence is increasing worldwide (2-4).

Despite the huge threat posed by sepsis on humanity, no comprehensive clinical guidelines existed until 2002. Hopeful that outcomes of sepsis might be improved by standardizing care, the European Society of Intensive Care Medicine, the International Sepsis Forum and the Society of critical care Medicine launched the Surviving Sepsis Campaign (SSC or "Campaign") (5).

Evidence based guidelines were developed and the initial guidelines were published in 2004 (6). A further improved and updated version of the guidelines was published in 2008 (7). In medical practice, a spectrum of decision support tools is usually available to assist in the management of complex patients. This could be in the form of guidelines or more ideally clinical management protocols (8). While protocols are a set of specific, explicit, algorithmic rules which direct clinical management or research, guidelines are general, flexible rules that are tolerant to latitude among clinicians.

The development and publication of guidelines does not however always lead to changes in clinical behaviour. Weinert *et al* (9) studied the impact of randomized trial results on acute lung injury ventilator therapy in university teaching

hospitals and concluded that clinicians practicing at those hospitals did not rapidly adopt low tidal volume ventilation that may reduce mortality.

The most effective means of transforming scientific evidence into bedside clinical practice remains an unanswered question across all medical disciplines (10, 11).

This challenge of translating scientific evidence into bedside clinical practice is magnified in the developing world with scarce adequately trained human resource and a medical infrastructure whose development has been largely ignored.

Many less developed countries have developed critical care services after a delay of 15- 20 years relative to industrialized countries (12).

There are few studies, if any, that have attempted to document practice in intensive care units in Sub-Saharan Africa (13). Dunser *et al* in their review and analysis of intensive care medicine in the least developed countries noted that sepsis was one of the commonest indications for admission to intensive care units (23). They also noted that in view of lack of scientific data addressing this issue in the least developed world, their review was to a substantial part based on personal experience of the authors in Africa and Asia.

Intensive care units are very expensive to run and resource utilization is critical in Africa where poverty is rampant (14).

Dunser *et al* in their review and analysis of intensive care medicine in the least developed countries noted that sepsis was one of the commonest indications for admission to intensive care units (23).

The aim of this study is to help document the appropriateness of ICU care in septic patients in this region and hopefully identify areas that need more education and guideline performance improvement.

MATERIALS AND METHODS

Approval from the Aga Khan University Research and Ethics committee for our survey was sought and obtained.

The survey was conducted from May to August 2010. We sent questionnaires to physicians from all the disciplines that admit adult septic patients to our ICU. The questionnaire asked the physicians to respond to sepsis resuscitation and management bundles as per their usual clinical practice when they cared for septic patients. An investigator was available to explain any technical terms in the questionnaire that the physicians were not familiar with.

RESULTS

Of the 46 questionnaires sent out, 26 were returned and found complete for analyses representing a response rate of 56.5%. A breakdown of the specialties of the physicians who responded is illustrated in Table 1.

Table 1
Specialties of the physicians who responded

Specialty	(n=26)	
	Frequency	(%)
Anaesthesia	6	23
General Surgery	10	38
Internal Medicine	7	27
Obstetric & Gynaecology	3	12

There was varied compliance to the initial care resuscitation bundle for the initial 6 hours. Compliance varied from as low as 54% for administration of broad spectrum antibiotics within the first hour of recognition of septic shock to as high as 96% for use of vasopressors in septic patients.

There was likewise varied compliance in the management bundle with very low rates (0%) for administration of drotrecogin alfa in indicated patients to highs of 100% stress ulcer and deep venous thrombo-prophylaxis. These compliance results are summarized in Table 2.

Table 2
Compliance in the management bundle (n=26)

	(n=26)	
	n	% compliance
Initial Care Bundle (First 6 hours of presentation)		
Fluid resuscitation to endpoints	24	92
Blood culture before antibiotics	15	57
Broad spectrum antibiotics in 1 st hour	14	54
Vasopressors	25	96
Management bundle (First 24 hours after presentation)		
Steroid policy	9	35
Drotrecogin alfa where indicated	0	0
Glucose control policy	21	81
Protective lung strategy for ALI/ ARDS	24	92
Sedation Analgesia/Muscle relaxant policy	18	69
Sodium bicarbonate policy	6	23
CRRT	14	54
VTE prophylaxis	26	100
Stress ulcer prophylaxis	26	100
Selective digestive decontamination	4	15

ALI - Acute Lung Injury

ARDS - Acute respiratory distress syndrome

CRRT -Continuous renal replacement therapy

VTE- Venous thromboembolism

DISCUSSION

Our study shows that while our ICU physicians had conformity rates of above 50% in the initial resuscitative phase care bundle for septic patients, they also had conformity rates as low as 0-35% in the management bundle for severe sepsis.

There are hardly any studies that have assessed care pathways for septic critically ill patients in Africa. Levy et al in their study of an international guideline based performance improvement programme targeting severe sepsis looked at compliance in hospitals in the United States, Europe and South America (15). They had a final compliance rate of 77% in use of fluids and vasopressors and 78.3% in collecting blood cultures prior to antibiotic use. In our study 94% of our physicians complied on use of fluids and vasopressors while only 57% obtained blood cultures prior to antibiotic use. In the management bundle, our physicians had high compliance rates in glucose control, protective lung strategy ventilation, sedation policy, VTE prophylaxis and stress ulcer prophylaxis at 81, 92, 69 and 100% respectively.

Steroid use in ICU has remained controversial and this could explain the low compliance rate among our physicians (16, 17). Drotrecogin alpha despite being found to be cost effective elsewhere is unaffordable to our patients, the majority having no medical insurance (18,19). Sodium bicarbonate use to treat acidaemia was not popular amongst the surveyed physicians and use of CRRT was low since few physicians had trained on this modality of renal replacement therapy despite its availability.

Our survey was not designed to find a relationship between compliance to bundle targets and hospital mortality. Levy et al showed that after adjustment for baseline characteristics, administration of broad spectrum antibiotics, obtaining blood cultures before their initiation and maintaining blood glucose control were all associated with lower hospital mortality (15).

There was low compliance to selective digestive contamination yet this has been found useful in reducing infections, especially pneumonia and mortality, in the general population of critically ill and trauma patients. (20-22).

Our survey has some limitations. The results of our study cannot be generalised as it was conducted in only one centre and most of the study participants were faculty and senior residents of the postgraduate medical education programme. This would have had an impact on their knowledge and use of therapies in resuscitation and management bundles for severe sepsis as compared to a similar survey conducted elsewhere.

Although we surveyed a relatively small number of physicians, 26, this strikingly is one of the highest numbers of doctors caring for critically patients in a single centre in East Africa.

A major limitation of intensive care medicine in the developing world is the deficiency of a broad training and educational programme for intensive care physicians (24). There is thus a lack of knowledge of contemporary therapeutic standard which often results in stereotypical, obsolete drug therapies and frequently avoidable problems such as high incidence of nosocomial infections (25).

In conclusion, our study has shown that while we may have wide access to evidence based medicine, and specifically sepsis guidelines, there is still varied conformity amongst our physicians caring for these patients.

Educational and performance improvement initiatives need to be undertaken so that septic patients in this region benefit from improved hospital outcomes associated with improved physician conformity to evidence based sepsis guidelines.

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