SHORT REPORT

Knowledge, attitudes, practices and perceived barriers of emergency health care providers regarding sepsis and septic shock in a tertiary care centre: A cross-sectional study

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Abstract

This study aimed to assess knowledge, attitudes, practices, and perceived barriers of emergency healthcare providers regarding the management of sepsis and septic shock. This cross-sectional study was conducted in the Emergency Department of Aga Khan University Hospital, Karachi, Pakistan from August to October 2017. A total of 53 healthcare providers participated in the study. Overall, 42(79%) of the participants demonstrated correct knowledge of the sepsis bundle. The most common barrier reported in the compliance of the sepsis bundle was a shortage of staff (62%), followed by delayed presentation of patients (58%) and overcrowding (42%). Furthermore, better staffing was perceived by the participants (60%) to improve the care of septic patients, followed by sepsis awareness sessions (23%) and reduction in ED crowding (11%). Staff shortage, delayed presentation of patients, and ED overcrowding were considered the most common barriers in the management of sepsis in this setting.

Keywords: Sepsis, septic-shock, emergency department, KAP.

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Introduction

Sepsis is a clinical syndrome that complicates severe infection. Globally the prevalence of hospital-treated sepsis in adults is 270 per 100,000 with an estimated overall mortality of around 26%.[1,2] In Pakistan, the mortality rate has been reported as 40-80%[3] which is far more than that reported internationally.[4] In recent years many definitions and timelines have been proposed for sepsis management. The Surviving Sepsis Campaign (SSC) guidelines have outlined an early goal-directed therapy (EGDT), later followed by a 3-hour sepsis bundle[5,6] and a very recently 1-hour sepsis bundle which demonstrates a standardized approach to ensure prompt and effective management of sepsis.[3,7] Although the strength of evidence of a 1-hour sepsis bundle is still being debated globally, early diagnosis and treatment remain the cornerstone of therapy for improved outcomes in these patients.[7,8] Hence, the ED staff is in a unique position to identify and timely manage to change the outcome of sepsis patients.[5] Although proven effective internationally, compliance rates and knowledge of resuscitation bundles are as low as 7.6% to 3.5%.[1,5] This study aimed to have an idea of what is known, believed and practiced by healthcare providers with regards to following the current sepsis guidelines, and to identify barriers associated with the application of evidence-based practice. Once these factors are recognised, targeted quality improvement and educational interventions can be implemented.[9,10]

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Methodology, Results, and Discussion

This cross-sectional study was conducted in a 60 bedded Emergency Department (ED) of an urban tertiary care teaching hospital in a lower-middle-income country. Approval for the study was taken from the Ethical Review Committee. The target population of 60 was identified, which included all physicians (including postgraduate medical trainees (PGMT) and non-trainee ED physicians) and nursing staff working for more than six months in critical areas of the Emergency Department and looking after sepsis patients. Non-probability convenient sampling technique was used, and the study was completed three months after the ERC approval. A predesigned self-administered questionnaire, based on the Surviving Sepsis Campaign (SSC) guidelines 2016,[1] was used for data collection. It was distributed over a period of two weeks at four different points in time in the ED to ensure maximum participation. Respondents were asked Open and Closed-ended questions regarding Baseline knowledge, Current practices in treatment, Difficulties encountered in managing sepsis, Perceived barriers to implementation of resuscitation protocols, and suggestions for better management of sepsis patients. Demographic data such as gender and number of years in practice for PGMT, non-trainee physicians as well as nurses were also collected. Confidentiality was maintained, and data was kept under lock and key

Table-1: Background information (n=53).

Age(Mean ± SD)	28.4 ± 3.4	
Gender*		
Male	34	64.2%
Female	17	32.1%
Profession/job title/position		
PGMT¥	28	52.8%
ED Physician	12	22.6%
Nurses	13	24.5%
Total years of practicing		
1-5 years	26	49.1%
>5	27	50.9%

*2 missing data points in gender category
¥PGMT, Post graduate medical trainees; ED physician, Non trainee emergency physician.

Table-2: Study participants demonstrating Correct Sepsis Knowledge (n=53).

PGM	Overall Overall	PGMT PGMT	ED physician Physicians	Nurse Nurses
3 Hr. Bundle knowledge	42 (79.3%)	21 (75%)	10 (83.3%)	11 (84.6%)
Blood cultures before¥	50 (94.3%)	25 (89.3%)	12 (100%)	13 (100%)
Resuscitation protocolΩ	49 (92.5%)	28 (100%)	8 (66.7%)	13 (100%)
Antibiotics within 1 hour	48 (90.6%)	27 (96.4%)	10 (83.3%)	11 (84.6%)
Lactate within 1 hour	48 (90.6%)	24 (85.7%)	12 (100%)	12 (92.3%)
Lactate threshold	24 (45%)	10 (35.7%)	9 (75%)	5 (50%)
		Vasopressor (1st line)		
Nor Epinephrine	51 (96%)	27 (96.4%)	12 (100%)	12 (92.3%)
Dopamine/Vasopressin	2 (4%)	1 (3.6%)	0 (0%)	1 (7.7%)
		Fluid bolus		
At least 30ml/kg	38 (72%)	19 (67.9%)	10 (83.3%)	9 (69.2%)
Less than 30ml/kg	15 (28%)	9 (32.1%)	2 (16.7%)	4 (30.8%)
Self-reported compliance of sepsis bundle>75%	20 (37.7%)	8 (28.5%)	7 (58.3%)	5 (38.4%)

¥Sending blood cultures before antibiotic administration, ΩAwareness of resuscitation protocol.

accessible to only the principal investigator. Hospital data retention policy was used. Data entry was double punched and verified. Frequencies and percentages were calculated for categorical variables such as healthcare providers having the correct knowledge of resuscitation bundle, blood culture sending time, lactate sending time, lactate threshold, correct vasopressor, and fluid choice as well as self-reported compliance to resuscitation. For analysis, Statistical Package for Social Science (SPSS) version 16 was used.

A total of 53 healthcare professionals participated in the study. The majority were PGMT 28(52.8%) followed by nurses 13(24.5%) and non-trainee physicians 12(22.6%), 34 (64.2%) were males, belonging to 26-30 years of age group. Most of the participants, i.e.,37 (69.8%), have been practicing for less than five years (Table-1)

Overall, 42(79.3%) of the participants demonstrated correct knowledge of sepsis bundle, including 21(75%) PGMT, 10(83%) ED physicians, and 11(84%) nurses. Almost all ED physicians and nurses were aware of the importance of sending blood culture before the administration of antibiotics 50(94.3%). A majority of PGMT 27(96.4%), ED physicians 10(83.3%), and nurses 11(84.6%) said a patient with sepsis should receive antibiotics within one hour. Almost all nurses and PGMT were aware of sepsis resuscitation protocol 49(92.5%).

Figure-1: Perceived barriers in implementation of sepsis protocols (N=53).

Nearly all ED physicians were aware that within one hour, lactate should be performed, and norepinephrine be used as an initial choice of vasopressor. Less than half of PGMT 10(35.7%), half of the nurses 5(50%), and three-quarters of ED physicians 9(75%) were aware of the lactate threshold. Only 19(67.9%) of PGMT and 9(69.2%) of nurses, while 10(83.3%) of the ED physicians were aware of fluid administration protocol in a sepsis patient.

The most commonly perceived barrier in implementing sepsis protocol reported by the majority of the participants is a shortage of staff 33(62%), followed by delayed presentation of patients 30(58%) and overcrowding 22(42%). (Figure-1). On the other hand, better staffing is perceived by the majority of the participants 31(60%) for improving the care of septic patients followed by protocol compliance 15(28%), awareness sessions 12(23%), and reduction in ED overcrowding 6(11%).

The survey demonstrated that the majority of the participants (PGMT, ED physicians, nurses) have adequate knowledge regarding the 3-hour sepsis bundle; however, perceived compliance to sepsis bundle was not satisfactory. In our study, respiratory tract and urinary tract infections were reported as most common etiologic causes of sepsis in ED which is comparable to the data presented by Alan E. et al.[11] Timely antibiotic administration after sending blood cultures in the septic patient was well acknowledged by the participants, which is in accordance with the recent guidelines; data in other studies show significant increase in mortality due to the delay in antibiotic administration; hence, the finding is noteworthy. Also appropriate choice of vasopressors was observed.

Lactic acid is one of the vital component of sepsis bundle which was well known to 48(90%) of the participants; however, there was a knowledge gap regarding the threshold of lactate, known only to 24(45%), while another study showed correct knowledge in 24%. Furthermore, the choice (IV crystalloid fluids) and amount (30ml/kg) of fluid for resuscitation was also a subject where knowledge was lacking, correct knowledge reported by 38(72%). Similar results were observed by CV Hengel et al.[12] and Zeliha Kocak Tufan et al.[13]

The majority of PGMT and non-trainee ED physicians reported Procalcitonin, arterial blood gases, and blood cultures as the initially ordered tests for diagnosing sepsis, which is following the institutional guidelines. In contrast, complete blood count and electrolytes were recommended by only a quarter of the participants.

Interestingly, only 11% of the participants perceived a lack of knowledge as a barrier in providing quality care, yet 23% suggested conducting more knowledge sessions. Other barriers identified were the shortage of staff, late presentation, which was also reported in previous studies.

One limitation of our study is that we only surveyed self-reported knowledge and practices of healthcare providers and did not check their compliance with the guidelines. Also, our study was conducted at an urban tertiary care teaching hospital targeting the emergency health care workers and did not calculate a sample size therefore the findings may not be generalized to the community at large. Therefore, we suggest performing a follow up multicentre study, which will be further helpful in establishing the need assessment and consequently planning corrective interventions.

Conclusion

Emergency healthcare providers demonstrated adequate knowledge but reported lesser perceived compliance in the implementation of a 3-hour sepsis bundle. Most of the participants reported that a shortage of staff and delayed presentation of sepsis patients are the biggest roadblocks in the optimal management of sepsis in the emergency department. Educators, as well as hospital administrators and policymakers, can use these results for planning strategies to improve sepsis-related mortality in the future.

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Conflict of Interest: None to declare

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References

1. Seymour CW, Liu VX, Iwashyna TJ, Brunkhorst FM, Rea TD, Scherag A, et al. Assessment of clinical criteria for sepsis: for the Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). JAMA. 2016; 315:762-74.
2. Jamil B, Qureshi KA, Khan M, Ujan VA. Assessment of four mortality prediction models in intensive care unit patients with sepsis. Renal failure (acute and chronic). 2004; 5:33-3.
3. Thompson K, Venkatesh B, Finfer S. Sepsis and septic shock: current approaches to management. Intern Med J. 2019; 49:160-70.
4. Yende S, Austin S, Rhodes A, Finfer S, Opal S, Thompson T, et al. Long-term quality of life among survivors of severe sepsis: analyses of two international trials. Crit Care Med. 2016; 44:1461-

7.
5. Fleischmann C, Scherag A, Adhikari NK, Hartog CS, Tsaganos T, Schlattmann P, et al. Assessment of global incidence and mortality of hospital-treated sepsis. Current estimates and limitations. Am J Respir Crit Care Med. 2016; 193:259-72.
6. Spiegel R, Farkas JD, Rola P, Kenny J-E, Olusanya S, Marik PE, et al. The 2018 Surviving Sepsis Campaign's treatment bundle: when guidelines outpace the evidence supporting their use. Ann Emerg Med. 2019; 73:356-8.
7. Memon JI, Rehmani RS, Alaithan AM, El Gammal A, Lone TM, Ghorab K, et al. Impact of 6-hour sepsis resuscitation bundle compliance on hospital mortality in a Saudi hospital. Crit Care Res Pract. 2012; 2012:273268.
8. Reinhart K, Daniels R, Kissoon N, Machado FR, Schachter RD, Finfer S. Recognizing sepsis as a global health priority-a WHO resolution. New Eng J Med. 2017; 377:414-7.
9. Deis AS, Whiles BB, Brown AR, Satterwhite CL, Simpson SQ. Three-hour bundle compliance and outcomes in patients with undiagnosed severe sepsis. Chest. 2018; 153:39-45.
10. Levy MM, Evans LE, Rhodes A. The surviving sepsis campaign bundle: 2018 update. Intensive Care Med. 2018; 44:925-8.
11. Jones AE, Heffner AC, Horton JM, Marchick MR. Etiology of illness in patients with severe sepsis admitted to the hospital from the emergency department. Clin Infect Dis. 2010; 50:814-20.
12. Van den Hengel L, Visseren T, Meima-Cramer P, Rood P, Schuit S. Knowledge about systemic inflammatory response syndrome and sepsis: a survey among Dutch emergency department nurses. Int J Emerg Med. 2016; 9:19.
13. Tufan ZK, Eser FC, Vudali E, Batirel A, Kayaaslan B, Bastug AT, et al. The knowledge of the physicians about sepsis bundles is suboptimal: a multicenter survey. Journal of clinical and diagnostic research: JCDR. 2015; 9:OC13-6.