Clinical Outcomes of Community-Acquired Severe Sepsis after Implementation of a Simple Severe Sepsis Fast Track

Sujinda Ruangchan MD*, Sarunyou Chusri MD, PhD**, Pornthip Saengsanga MNS*, Nongnuch Kiamkan MNS*, Pakakrong Phunpairoth MNS*, Panthip Chayakul MD**

** Department of Medicine, Songkhla Hospital, Songkhla, Thailand*
*** Division of Infectious Disease, Department of Internal Medicine, Faculty of Medicine, Prince of Songkla University, Songkhla, Thailand*

Background: *Severe sepsis and septic shock are the most common causes of in-hospital death in Songkhla Provincial Hospital and half of the patients are transferred from community hospitals. A simple severe sepsis and septic shock fast track had been implemented in all community hospitals in Songkhla Province and in Songkhla Provincial Hospital in December 2013.*
Objective: *Evaluate the clinical outcomes and predictors of mortality of severe sepsis and septic shock patients after implementation of the simple severe sepsis and septic shock fast track.*
Material and Method: *A retrospective study of all available medical records between December 2013 and May 2014 of hospitalized patients aged older than 15 years with a final diagnosis of severe sepsis or septic shock.*
Results: *Of 723 patients diagnosed as community acquired sepsis, 228 (31.5%) patients were diagnosed with severe sepsis or septic shock. A simple severe sepsis and septic shock fast track were activated in 69.3%. Patients in the activated fast track group had significantly lower mortality than the non-activated fast track group (21.0% vs. 42.9%, p = 0.001). After adjusted analysis, the four independent risk factors associated with increased mortality in severe sepsis and septic shock were initial presentation with systolic blood pressure lower than 90 mmHg (adjusted odds ratio [aOR] 2.57), central nervous system failure (aOR 7.33), acute renal failure (aOR 5.07), and received norepinephrine (aOR 2.87). Two factors associated with a significant decrease in mortality were the simple fast track activated at the emergency department (aOR 0.22) or at the ward (aOR 0.09) and received appropriate initial antibiotics (aOR 0.09).*
Conclusion: *Early recognition and early resuscitation in case of severe sepsis and septic shock can reduce mortality. A simple severe sepsis and septic shock fast track should be implemented in all community hospitals. It is a simple clinical diagnosis with simple management that is possible in every community hospital before transfer to a secondary or tertiary care hospital.*

Keywords: *Severe sepsis, Septic shock, Death, Fast track*

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Severe sepsis and septic shock were the most common cause of death in Songkhla Provincial Hospital and half of them are referred from community hospitals (primary care hospitals) in Songkhla Province. Due to high mortality rates in severe sepsis and septic shock[1-3], many interventions and guidelines are used for early recognition and early treatment of severe sepsis and septic shock[4-9]. However, in resource limited settings, it is difficult to complete the guidelines such as measurement of central venous pressure (CVP), continuous monitoring of central venous oxygen saturation ($ScvO_2$), and measurement of serum lactate.

Correspondence to:
Chusri S, Department of Medicine, Songkhla Hospital, Songkhla 90100, Thailand.
Phone: +66-74-446824, Fax: +66-74-446825
E-mail: sarunyouchusri@hotmail.com

Songkhla Provincial Hospital made a simple severe sepsis and septic shock fast track that was modified from the Surviving Sepsis Campaign 2013[4] and Buddhachinaraj Hospital, Thailand for early recognition and treatment of severe sepsis and septic shock in the community hospital setting, which is the first place for resuscitation of patients. It comprised of an early diagnosis with five procedures for immediate initial resuscitation at the time of diagnosis of severe sepsis. Those are 1) hemoculture within one hour, 2) empirical antibiotics within one hour, 3) fluid resuscitation with normal saline of at least 1,500 to 2,000 mL (according to age and underlying cardiovascular disease) within two hours, 4) early administration of a vasopressor if the mean arterial blood pressure was still lower than 65 mmHg after initial fluid resuscitation, and 5) intensive care unit

(ICU) admission if available or contact Songkhla Provincial Hospital for patient transfer. The severe sepsis fast track was implemented to all emergency departments and wards of the community hospitals in Songkhla Province and Songkhla Provincial Hospital in December 2013. The objectives of the present study were to evaluate the clinical outcomes of severe sepsis and septic shock patients after implementation of the simple severe sepsis and septic shock fast track and to evaluate the predictors of mortality of severe sepsis and septic shock after implementation of the simple severe sepsis and septic shock fast track.

Material and Method

Study design and population

A retrospective study was conducted at Songkhla Provincial Hospital, which is a 508-bed secondary care hospital located in Songkhla City, Songkhla Province in southern Thailand. All adult patients between December 2, 2013 and May 31, 2014 aged 15 years or older who were hospitalized with a diagnosis of sepsis, severe sepsis with or without organ failure according to the guidelines of the Surviving Sepsis Campaign 2013 were included. The medical charts were reviewed. A community-acquired setting was defined as clinical sepsis or severe sepsis that was documented within 48 hours after admission. Patient characteristics, previous medical illness, clinical presentation, initial diagnosis and management, use of the simple severe sepsis/septic shock fast track, and outcome of treatment, which included mortality and length of hospital stay, were recorded. The severity of organ failure was assessed by the Sequential Organ Failure Assessment (SOFA) score. Empiric antibiotic therapy was considered appropriate if it included intravenous and/or oral antimicrobials for the specific bacterial isolation. In cases of unavailable culture or negative hemoculture, it was considered appropriate by opinion of an infectious disease specialist according to the patient characteristics, primary site of infection, epidemiology, and risk factors of bacterial resistance. Patients with unavailable medical records were excluded. Medical chart reviews of the patients and data collection were performed by the first author and two well trained nurses. The study protocol was approved by the Ethics Committee at Songkhla Provincial Hospital.

Statistical analysis

The Epicalc package in R Software was used for the statistical analysis. The mean with standard deviation or median and range were used to describe the continuous variables. The categorical variables were described by proportion. The Student t-test or Mann-Whitney U test was used to compare the continuous variables and the Chi-square test or Fisher's exact test was used as appropriate for comparison of categorical variables of the clinical presentations between patients in the activated fast track group and non-activated fast track group, survivor group, and non-survivor group. Univariate and multivariate logistic regression analyses were done between the survivor and non-survivor groups. The variables that had a *p*-value <0.2 in the univariate analysis were included in the final multivariable model. A *p*-value <0.05 was considered statistically significant.

Results

Between December 2013 and May 2014, 723 patients of were diagnosed with community acquired sepsis and 228 (31.5%) patients were diagnosed with severe sepsis or septic shock. Fifty-four percent of the cases were referred from seven community hospitals (Chana, Thepha, Ranod, Sathing Phra, Singhanakhon, Krasaesin, Muang Songkhla) located in Songkhla Province. The mean age of the patients was 62.9±18.2 years and 63.2% of them were aged 60 years or older. The male to female ratio was 1:1.1. The simple severe sepsis fast track was activated in 158 patients (69.3%) and 93.4% of all activated patients began at the emergency department of the community hospitals or Songkhla Provincial Hospital.

The most common presentation of severe sepsis was sepsis induced hypotension, which was found in 65% (41.7% were septic shock), followed by acute respiratory failure in 40.0%. Only 6.2% had acute lung injury with a PaO_2/FiO_2 ratio smaller than 200, acute renal failure with serum creatinine greater than 2.0 mg/dL in 30%, hyperbilirubinemia with a total bilirubin greater than 2 mg/dL in 22.3%, and thrombocytopenia with a platelet count ≤100,000 cells/μL in 15.0%. The mean total SOFA score of patients was 5.0±3.7. The overall mortality of the patients with severe sepsis/septic shock was 27.8%, and the total hospital length of stay was 8.3±9.4 days. Pneumonia was the most common site of infection, which was found in 35%, followed by urinary tract infection in 30%, and skin/soft tissue infection in 11.4%. Hemocultures were positive in 28.6% of severe sepsis cases. Fifty-three percent of positive hemocultures were *Escherichia coli* and 38.0% of them were ESBL producing strains and other gram negative bacilli were found in 26.5% and

gram positive cocci in 20.0%. The baseline patient characteristics and clinical presentations of severe sepsis or septic shock according to the activated severe sepsis fast track in seven community hospitals and Songkhla Provincial Hospital between December 2013 and May 2014 are shown in Table 1.

There were no significant differences in the clinical characteristics or clinical presentations of severe sepsis or septic shock between the activated fast track group and the regular track group except the presence of systolic blood pressure lower than 90 mmHg on arrival, which was significant in the activated fast track group (71.5% vs. 51.4%, $p = 0.005$). The five procedures in the simple severe sepsis and septic shock fast track were evaluated and all procedures in the activated fast track group were statistically significant compared with the regular track group. The mortality rate of patients in the activated fast track group was statistically significantly lower compared with the regular track group (21.0% vs. 42.9%, $p = 0.001$). However, there were no differences in the ICU and hospital length of stay between the two groups (Table 2).

In the non-survivor group, a statistical significance was found in older age (50.0 vs. 64.0, $p = 0.014$), less activated severe sepsis and septic shock fast track (52.4 vs. 75.6, $p = 0.002$), higher SOFA score (7 vs. 4, $p<0.001$), initial presentation with central nervous system failure (62.9 vs. 22.7, $p<0.001$), and initial presentation with acute renal failure (67.7 vs. 40.5, $p<0.001$) (Table 3).

The five procedures in the simple fast track were evaluated and statistical significant differences were found in norepinephrine received (45.2% vs. 29.0, $p = 0.033$) and received less than the median amount of intravenous fluid within two hours (650 mL vs.

Table 1. Baseline patient characteristics and clinical presentations of severe sepsis or septic shock between December 2013 and May 2014 according to the activated fast track

Variables	Regular track (n = 70)	Fast track (n = 158)	*p*-value
Median age (years), (IQR)	66.5 (55.2, 79)	66 (47, 77.8)	0.272
Age groups			0.496
<60	23 (32.9)	61 (38.6)	
≥60	47 (67.1)	97 (61.4)	
Male sex	32 (45.7)	75 (47.5)	0.920
Have co-morbidities	57 (81.4)	114 (72.2)	0.185
Infection sites			0.078
Respiratory	29 (42.0)	53 (34.2)	
Skin and soft tissue	3 (4.3)	23 (14.8)	
GI	5 (7.2)	17 (11.0)	
UTI	20 (29.0)	48 (31.0)	
Leptospirosis/scrub typhus	2 (2.9)	5 (3.2)	
Unknown	10 (14.5)	9 (5.8)	
Number of SIRS criteria met			0.176
2	28 (40.0)	52 (32.9)	
3	34 (48.6)	72 (45.6)	
4	8 (11.4)	34 (21.5)	
Systolic BP <90 mmHg at presentation	36 (51.4)	113 (71.5)	0.005
Median SOFA score, (IQR)	4 (2, 6)	4 (2, 8)	0.233
Cardiovascular hypotension	32 (46.4)	91 (58.0)	0.143
Central nervous system failure	27 (39.1)	49 (31.2)	0.314
Acute renal failure	31 (44.9)	78 (49.7)	0.607
Acute respiratory failure	26 (37.7)	65 (41.4)	0.705
Thrombocytopenia	17 (24.6)	49 (31.2)	0.400
Increased total bilirubin	23 (33.8)	50 (31.8)	0.892

IQR = interquartile range; GI = gastrointestinal; UTI = urinary tract infection; SIRS = systemic inflammatory response syndrome; BP = blood pressure; SOFA = sequential organ failure assessment
Except where noted otherwise, data are number (%) of patients

Table 2. Clinical practices and outcomes of severe sepsis or septic shock between December 2013 and May 2014 according to the activated fast track

Variables	Regular track (n = 70)	Fast track (n = 158)	*p*-value
Hemoculture within 1 hour	35 (50.0)	143 (91.7)	<0.001
Received ATB within 1 hour	28 (40.0)	141 (90.4)	<0.001
Initial ICU admission	5 (7.1)	26 (16.5)	0.013
Received dopamine and/or norepinephrine	23 (33.3)	92 (59.0)	<0.001
Received norepinephrine	15 (21.7)	60 (38.5)	0.021
Median total fluid in 2 hours (mL), (IQR)	220 (160, 627.5)	1,500 (1,000, 2,000)	<0.001
Median total fluid in 6 hours (mL), (IQR)	895 (480, 1,957.5)	2,400 (1,645, 3,000)	<0.001
Median hospital LOS (days), (IQR)	6 (3, 10)	5.5 (4, 10)	0.932
Median ICU LOS (days), (IQR)	6 (4, 7.8)	3 (2, 8)	0.191
Mortality	30 (42.9)	33 (21.0)	0.001

ATB = antibiotics; ICU = intensive care unit; IQR = interquartile range; LOS = length of stay
Except where noted otherwise, data are number (%) of patients

Table 3. Clinical presentation of sever sepsis/septic shock between the survivor and non-survivor groups between December 2013 and May 2014

Variables	Non-survivor (n = 63)	Survivor (n = 164)	*p*-value
Median age (years), (IQR)	70 (58.5, 80.5)	64 (47, 76)	0.014
Age ≥60 years	47 (74.6)	96 (58.5)	0.036
Male sex	28 (44.4)	79 (48.2)	0.722
Activated fast track	33 (52.4)	124 (75.6)	0.002
No	30 (47.6)	40 (24.4)	
Yes, at ER	31 (49.2)	111 (67.7)	
Yes, at ward	2 (3.2)	13 (7.9)	
Have co-morbidity	50 (79.4)	120 (73.2)	0.428
Infection sites			0.401
Respiratory	28 (45.2)	53 (32.9)	
Skin and soft tissue	8 (12.9)	18 (11.2)	
GI	5 (8.1)	17 (10.6)	
UTI	15 (24.2)	53 (32.9)	
Leptospirosis/scrub typhus	0 (0)	7 (4.3)	
Unknown	6 (9.7)	13 (8.1)	
Number of SIRS criteria met			0.328
2	27 (42.9)	53 (32.3)	
3	26 (41.3)	79 (48.2)	
4	10 (15.9)	32 (19.5)	
Systolic BP <90 mmHg at presentation	46 (73.0)	103 (62.8)	0.195
Median SOFA score, (IQR)	7 (5, 10)	4 (1.2, 5.8)	<0.001
Cardiovascular hypotension	41 (66.1)	82 (50.3)	0.048
Central nervous system failure	39 (62.9)	37 (22.7)	<0.001
Acute renal failure	42 (67.7)	66 (40.5)	<0.001
Acute respiratory failure	27 (43.5)	64 (39.3)	0.665
Thrombocytopenia	22 (35.5)	43 (26.4)	0.237
Increased total bilirubin	25 (40.3)	47 (29.0)	0.144

IQR = interquartile range; ER = emergency room; GI = gastrointestinal; UTI = urinary tract infection; SIRS = systemic inflammatory response syndrome; BP = blood pressure; SOFA = sequential organ failure assessment
Except where noted otherwise, data are number (%) of patients

1,500 mL, $p = 0.026$). These results were still significant even when the patients were separated by age group in the non-survivor group. Urine output greater than 0.5 mL/kg/hour at six hours after initial resuscitation was also significant in the non-survivor group (Table 4).

In multivariate analysis, four independent risk factors were associated with increased mortality in severe sepsis and septic shock, 1) initial presentation with systolic blood pressure less than 90 mmHg (adjusted odds ratio [aOR] 2.57), 2) central nervous system failure (aOR 7.33), 3) acute renal failure (aOR 5.07), and 4) received norepinephrine (aOR 2.87). Two factors were statistically significant in decreased mortality in severe sepsis and septic shock. The first one was the simple fast track that was activated at the emergency department (aOR 0.22) or at the ward (aOR 0.09), and the other was initially received appropriate antibiotics (aOR 0.09) (Table 5).

Discussion

The mortality of community-acquired severe sepsis is high. Before implementation of the simple severe sepsis and septic shock fast track, the mortality rate in Songkhla Provincial Hospital was 45% (unpublished data). A previous study at a regional

Table 4. Initial management and outcome of severe sepsis or septic shock between the survivor and non-survivor groups between December 2013 and May 2014

Variables	Non-survivor (n = 63)	Survivor (n = 164)	*p*-value
Hemoculture within 1 hour	48 (77.4)	129 (79.1)	0.935
Received ATB within 1 hour	46 (74.2)	122 (74.8)	0.943
Initial ICU admission	11 (17.5)	19 (11.6)	0.287
Received dopamine and/or norepinephrine	36 (58.1)	79 (48.8)	0.273
Received norepinephrine	28 (45.2)	47 (29.0)	0.033
Median total fluid in 2 hours (mL), (IQR)	650 (200, 1,500)	1,500 (400, 2,000)	0.026
Fluid in 2 hours according to age groups by median IV fluid			<0.001
Age <60 & IV <1,500	10 (16.9)	29 (18.0)	
Age <60 & IV ≥1,500	6 (10.2)	37 (23.0)	
Age ≥60 & IV <1,000	28 (47.5)	33 (20.5)	
Age ≥60 & IV ≥1,000	15 (25.4)	62 (38.5)	
Median total fluid in 6 hours, mL (IQR)	1,800 (900, 2,694.5)	2,170 (1,100, 2,810)	0.469
Urine output ≥0.5 mL/kg/hour at 6 hours	36 (57.1)	129 (79.1)	0.002
CVP was measured	2 (3.4)	8 (5.2)	0.732
Hematocrit ≥30% at 6 hours	51 (81.0)	140 (85.9)	0.475
Appropriate empirical ATB	41 (70.7)	153 (95.6)	<0.001

ATB = antibiotics; ICU = intensive care unit; IQR = interquartile range; IV = intravenous; CVP = central venous pressure
Except where noted otherwise, data are number (%) of patients

Table 5. Multivariate analysis of factors associated with mortality in severe sepsis or septic shock between December 2013 and May 2014

Variables	Crude OR (95% CI)	Adjusted OR (95% CI)	*p*-value
Systolic BP <90 mmHg at presentation	1.61 (0.82, 3.15)	2.57 (1.02, 6.44)	0.039
Central nervous system failure	5.44 (2.84, 10.41)	7.33 (3.06, 17.56)	<0.001
Acute renal failure	3.40 (1.78, 6.52)	5.07 (2.11, 12.23)	<0.001
Received norepinephrine	2.06 (1.10, 3.84)	2.87 (1.16, 7.09)	0.021
Appropriate empirical ATB	0.11 (0.04, 0.28)	0.09 (0.03, 0.33)	<0.001
Activated fast track			0.002
Yes at ER	0.39 (0.20, 0.74)	0.22 (0.09, 0.54)	
Yes at ward	0.24 (0.05, 1.18)	0.09 (0.01, 0.70)	

BP = blood pressure; ATB = antibiotics; ER = emergency room

hospital in the Northeast Thailand[10] showed a mortality rate of 73.9%. Another study in Thailand, from a tertiary-care university hospital in southern Thailand (both community and hospital acquired severe sepsis), showed a mortality rate of 49.7%. In other developing countries, such as the study from the Republic of Macedonia[1] in southeastern Europe, the overall mortality rate was 44.4%. In developing countries[3] the mortality rate is depended on the settings and severity of diseases. It could reach up to 30% for sepsis, 50% for severe sepsis, and 80% for septic shock.

The diagnosis of severe sepsis in this study used the simple severe sepsis and septic shock fast track that was based on clinical presentation and simple laboratory results. We did not use the initial serum lactate as part of the diagnosis because it was unavailable in the community hospitals and the global prevalence of severe sepsis patients who initially present with lactate greater than 4 mmol/L alone is only 5.4%[4]. For the follow-up and goal of therapy, we used a mean arterial pressure (MAP) greater than 65 mmHg together with a urine output greater than 0.5 mL/kg/hour or $ScvO_2$ greater than 70% (if CVP available). Thus, we used serum lactate only in the setting of a MAP greater than 65 mmHg but no urine output after resuscitation and unavailable CVP monitoring, and we defined adequate tissue perfusion if the serum lactate decreased at least 20% from the first level within two hours[11]. However, in our clinical practice, serum lactate was measured in only 1.8% of the patients in Songkhla Provincial Hospital after diagnosis as severe sepsis. Since we used serum lactate in limited situations, we could not use the serum lactate level as a predictor of mortality in severe sepsis as in other studies[1,12,13].

The present study demonstrated an easy real-life clinical practice of diagnosis and management of severe sepsis in a developing country at community hospitals and a provincial hospital in Songkhla Province in southern Thailand. After implementation of the severe sepsis fast track guideline, the overall mortality rate in severe sepsis decreased from 45.0 to 27.6%, and in the activated simple severe sepsis and septic shock fast track group the mortality rate decreased significantly from 45 to 21%. However, it was still high compared to the Goal-Directed Resuscitation for Patients with Early Septic Shock[14] that had a mortality rate of 18.6% in the early, goal-directed therapy group, and 18.8% in the usual-care group.

An adjusted analysis showed two factors that were associated with a significant decreased in mortalities in patients with severe sepsis and septic shock. The first one was the activated simple severe sepsis and septic shock fast track, which was comprised of simple procedures that previously showed decreased mortality in severe sepsis such as early antibiotics[4,15-17] and early fluid resuscitation[4,18-20]. The other one was appropriate empirical antibiotics that are known to decrease mortality in severe sepsis and septic shock[4].

A subgroup analysis of severe sepsis patients in the regular track group found that the cause of non-activated fast tract was due to an unidentified impending clinical crisis, which was found in 70% of the cases. These impending clinical crisis were patients diagnosed as only sepsis in the setting of sepsis-induced hypotension, acute respiratory failure, alteration of conscious, or acute renal failure that led to missed diagnoses of sepsis, which were found in 30% of the regular track group. The most common diagnoses were congestive heart failure and chronic obstructive pulmonary disease with acute exacerbation.

It was surprising that there was one independent risk factors of increased mortality in severe sepsis and septic shock. It was patients who received norepinephrine (aOR 2.87), which was different from the recommendation that norepinephrine is preferred as the treatment for septic shock rather than dopamine[4]. This is because half of the patients were referred from community hospitals and dopamine was the only vasopressor drug available in the community hospitals. Although norepinephrine is better than dopamine in the treatment of severe sepsis and septic shock, it is difficult to control the rate and maintain adequate vascular access before transferring the patient from the community hospital to the provincial hospital. This could cause leakage and tissue necrosis from norepinephrine. Therefore, most cases of severe sepsis and septic shock on arrival at the provincial hospital with a worsening clinical condition received norepinephrine in the late-course of the disease. In addition, patients with a missed diagnosis on arrival and developing severe sepsis received norepinephrine in the late course of the disease.

This study has some limitations. Due to the retrospective nature of the study, some information on the clinical manifestations and laboratory tests were missing as well as inadequate investigations and sample bias that could be from selection bias because the principle diagnosis and treatment depended on the first clinician. Therefore, the simple severe sepsis fast

track was activated only if the clinician recognized the signs of an impending crisis. The sample size was small. A prospective study is needed to confirm the efficacy of the simple severe sepsis fast track.

In summary, the present study showed the effective simple severe sepsis and septic shock fast track for early diagnosis and early resuscitation in severe sepsis or septic shock patients can be used at the community hospitals and in resource limited settings. The most important factors of a non-activating fast track was an unrecognized impending crisis or acute organ failure and a missed diagnosis of severe sepsis. Thus, improving the knowledge and awareness of organ failure as a part of the diagnosis of severe sepsis may help clinicians in early recognition and in the activated severe sepsis and septic shock fast track.

What is already known on this topic?

The Surviving Sepsis Campaign 2012 is an international guideline for management of severe sepsis and septic shock. It has been widely applied in many countries including the developing countries. The mortality rate of patients with severe sepsis and septic shock has decreased with early diagnosis and appropriate management according to this guideline.

What this study adds?

The international guideline recommends lactate level for diagnosis and follow-up treatment of severe sepsis as well as a central venous catheter to monitor oxygen saturation and determine fluid resuscitation needs and outcome of treatment. However, many tests and procedures in the international guideline are not available in many developing countries and especially in the community hospitals of Thailand. The findings in this study showed that the simple guideline used in this research could be used to make an early diagnosis from clinical signs, symptoms, and basic laboratory tests to stop the ongoing process of severe sepsis, which needs intensive treatment. This simple guideline can begin the treatment of severe sepsis in resource limited settings that can save lives. However, severe cases still need all of the procedures in the international guideline. Therefore, patients still need transfer to a provincial hospital.

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Potential conflicts of interest

None.

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ผลการรักษาผู้ป่วยติดเชื้อรุนแรงในชุมชนของโรงพยาบาลสงขลาและโรงพยาบาลชุมชนในเครือข่ายหลังดำเนินการตามแนวทางการดูแลผู้ป่วยติดเชื้อรุนแรงในทันทีที่ได้รับการวินิจฉัย

สุจินดา เรืองจันทร์, ศรัญญู ชูศรี, พรทิพย์ แสงสง่า, นงนุช เคี่ยมการ, ผกากรอง พันธุ์ไพโรจน์, พรรณทิพย์ ฉายากุล

ภูมิหลัง: *ภาวะติดเชื้อรุนแรงจากชุมชนจัดเป็นภาวะที่มีอัตราการเสียชีวิตสูง และพบว่าเป็นสาเหตุการเสียชีวิตที่พบมากที่สุดของผู้ป่วยที่มารับการรักษาในโรงพยาบาลสงขลา โดยผู้ป่วยส่วนใหญ่จะได้รับการส่งต่อมาจากโรงพยาบาลชุมชนใกล้เคียง ดังนั้นทางโรงพยาบาลจึงได้มีการจัดทำแนวทางการดูแลผู้ป่วยติดเชื้อรุนแรงในทันทีที่ได้รับการวินิจฉัย (a simple severe sepsis and septic shock fast track) เพื่อให้ผู้ป่วยได้รับการรักษาเบื้องต้นอย่างรวดเร็ว โดยเริ่มดำเนินงานในโรงพยาบาลชุมชนเครือข่าย และห้องฉุกเฉิน โรงพยาบาลสงขลา ตั้งแต่เดือนธันวาคม พ.ศ. 2556*

วัสดุและวิธีการ: *เก็บข้อมูลย้อนหลังโดยทำการทบทวนเวชระเบียนผู้ป่วยที่ได้รับการวินิจฉัยสุดท้ายว่าติดเชื้อรุนแรงที่เข้ารับการรักษาในช่วงเดือนธันวาคม พ.ศ. 2556 ถึง พฤษภาคม พ.ศ. 2557*

ผลการศึกษา: *มีผู้ป่วยได้รับการวินิจฉัยว่าติดเชื้อจากชุมชนทั้งหมดจำนวน 723 ราย และจัดอยู่ในกลุ่มที่มีการติดเชื้อรุนแรง 228 ราย (31.5%) มีการใช้ a simple severe sepsis and septic shock fast track คิดเป็น 69.3% และพบว่าผู้ป่วยที่ใช้แนวทางดังกล่าวมีอัตราการเสียชีวิตลดลงอย่างมีนัยสำคัญทางสถิติ 21% เปรียบเทียบกับ 42.9% ในกลุ่มที่ไม่ได้ใช้ และพบว่าปัจจัยที่มีผลต่อการเสียชีวิตในผู้ป่วย ได้แก่ มีความดันโลหิตต่ำแรกรับ มีอาการทางระบบประสาท ไตวาย และได้รับยา norepinephrine พบว่ามี 2 ปัจจัย ที่มีผลในการรอดชีวิตของผู้ป่วยคือ การใช้แนวทางการดูแลผู้ป่วยติดเชื้อรุนแรงในทันทีที่ห้องฉุกเฉิน และการได้รับยาปฏิชีวนะที่เหมาะสม*

สรุป: *การวินิจฉัยภาวการณ์ติดเชื้อรุนแรงได้อย่างรวดเร็วและให้การรักษาเบื้องต้นที่เหมาะสม ตามแนวทาง a simple severe sepsis and septic shock fast track สามารถลดอัตราการเสียชีวิตในผู้ป่วยกลุ่มนี้ได้ และควรจะพิจารณาใช้ในโรงพยาบาลชุมชนทุกแห่งเพื่อให้สามารถให้การวินิจฉัยและรักษาผู้ป่วยได้ก่อนส่งต่อไปยังโรงพยาบาลจังหวัดต่อไป*