Thai-Shock Survey 2013: Survey of Shock Management in Thailand

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Objective: Pragmatic surveys for shock management by Thai physicians are unavailable. The objective of this study is to identify the shock management patterns on both; the incidence of septic shock and hemorrhagic shock here in Thailand.
Material and Method: Two thousand questionnaires were sent to physicians who are called on to care for patients in shock across Thailand. The questionnaire is composed of 58 items regarding all aspects of the management of septic and hemorrhagic shock. A frequency scale has been defined by 5 levels of patient proportion estimates from routine practices.
Results: Between April and August, 2013, 533 of the distributed questionnaires (26.7%) were returned. In severe sepsis and septic shock management, 406 physicians (76.2%) have reported the routine use of the quantitative resuscitation protocols. Urine output, mean arterial pressures and central venous pressures have been more frequently used than central venous oxygen saturation and lactate levels for the resuscitation goals. Nearly 80% of these clinicians have shown "often and always" for the achievement of the resuscitation goals within 6 hours. Most of the physicians (65.3%) had never used procalcitonin biomarkers. Antimicrobial empirical treatments were started within 1 hour of admission for 87.7% of these patients and were continued for less than 5 days in 67.3% of the cases prior to de-escalating the treatments. Crystalloids have been the common, initial fluid used for resuscitation (98.9% in sepsis, 99.3% in trauma). The most commonly used vasopressors are norepinephrine (69.6%) for sepsis and dopamine (63.1%) for trauma. The median of the cortisol threshold level for steroid replacement therapy is 15 mg/dL, taken from the interquartile range or IQR of 5-19 mg/dL. Nearly all the physicians currently use hydrocortisone (96.4%). The median daily dose of hydrocortisone is 300 mg (IQR; 200-300). Approximately 50% of the physicians prescribed the hydrocortisone in divided doses to be administered every 8 hours and 31.8% ordered the medications as a continuous infusion. Tapering the dose in reduction varied by 33.6% of the physicians over a period of 2 to 3 days. Central venous pressures (CVP) and fluid challenge tests were more frequently used in the evaluation of preload rather than some of the newer fluid responsiveness methods. Less than 15% of the physicians continued to use pulmonary artery catheters in their routine practices. Regarding hemorrhagic and traumatic shock, only 162 physicians (39.3%) have been certified in Advance Traumatic Life Support (ATLS), but 311 physicians (75.6%) have reported in following with the ATLS guidelines. In patients requiring massive transfusions, physicians used packed red cells (PRC) and fresh frozen plasma (FFP) in a ratio of 1:1 (34.1%). Focus assessment sonography for trauma (FAST) was the most commonly used diagnostic method in cases of traumatic shock.
Conclusion: Most physicians manage shock with the current protocols. Hemodynamic goals are preferred over tissue perfusion targets. Early antimicrobial therapy and de-escalation are routinely practiced without the use of infective biomarkers. Crystalloids are preferred over colloids for the initial resuscitation. CVPs and fluid challenges are still preferred over the new fluid responsiveness methods for preload assessment. Hydrocortisone is the most common steroid prescribed for septic shock but the threshold of initiation, frequency of use and methods of discontinuation vary.

Keywords: Septic shock, Severe sepsis, Hemorrhagic shock, Steroid use, Antimicrobial therapy

The management of shock has been divided by the pathogenesis of the shock episode. The two most common types of shock are septic and hemorrhagic shock. In septic shock, nearly a decade of sepsis campaign guidelines for the management of severe sepsis and septic shock have been published and regularly updated[1,2]. These guidelines provide evidence-based management on multi-dimensional and bundle approaches. These are the primary axis and reference points for the local guideline modifications of the management of sepsis. In hemorrhagic shock,

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particularly in trauma patients, Advanced Trauma Life Support (ATLS) is the systemic approach taught universally[3]. This provides a step-by-step approach and resuscitation guidelines for the patients in traumatic shock. Additionally, there are many local guidelines and recommendations[4]. However, the patterns of management for shock treatment by Thai physicians, based on these guidelines, are unavailable. Therefore, the objective of this study is to identify the patterns of shock management on septic and hemorrhagic shock by Thai physicians.

Material and Method

The present study was based on a descriptive survey questionnaire on shock management here in Thailand. The Thai-Society of Critical Care Medicine (TSCCM study group) developed the questionnaire on shock management based on standard guidelines for septic and traumatic shock in the period of March to April of 2013. Fifty-eight questions were divided into two sections: 1) severe sepsis and septic shock management; 2) hypovolemic shock, hemorrhagic shock and traumatic shock. The questions include resuscitation details, line insertions, targets or resuscitation goals, cultures, antimicrobial and antiseptic use, types of intravenous fluids prescribed, blood transfusions, and hemodynamic monitoring methods. The authors defined frequency grades based on the estimated number of patients out of ten patients using certain methods or procedures. These were categorized into 5 levels: none, rarely, sometimes, often and always. Table 1 demonstrates the estimated frequency details.

The present study has focused on shock management in adult patients. Therefore, the target physicians with specialties in shock management, who were included in the present study, were internal medicine physicians (including cardiologists, infectious disease specialists, nephrologists, and pulmonologists), surgeons (including general surgeons, cardio-

vascular-thoracic surgeons, and trauma surgeons), anesthesiologists, intensivists or critical care physicians, emergency physicians and general practitioners given the responsibility for treating shock patients.

The running identification number was registered on each questionnaire. Two thousand registered questionnaires were sent to target physicians who were working in all the regional hospitals across Thailand. The questionnaires could be returned by mail or by electronic mail. One research assistant was responsible for checking all returned questionnaires and entering the data. Auditing data was randomly checked by a second researcher. Descriptive data was reported as percentages of categorized data. Non-parametric distribution data were reported as medians and interquartile ranges.

Results

In a 4 month period (April to August 2013), 533 questionnaires (26.7%), of the two thousand distributed, were returned and analyzed. The participating physicians' details are shown in Table 2. Nearly sixty percent of the participating physicians worked in a University-based hospital. The remaining

Table 1. Frequency grading

Grading	Estimated frequency (per 10 patients)
None	0
Rarely	1-3
Sometimes	4-6
Often	7-9
Always	10

Table 2. Physician characteristics of the responders

Characters	n (%)
Hospital levels	
General hospitals	35 (7.3)
Regional hospitals	124 (25.8)
University hospitals	279 (58.1)
Private hospitals	42 (8.8)
Regions	
Bangkok and central	198 (39.6)
North	131 (26.2)
North-east	32 (6.4)
East	63 (12.6)
South	76 (15.2)
Specialties	
Internal medicine	188 (40.17)
Surgery	116 (24.79)
Anesthesiology	75 (16.03)
Emergency medicine	48 (10.26)
Critical care medicine	19 (4.06)
Others	22 (4.70)
Status	
Resident	266 (63.64)
Academic practice	70 (16.75)
Non-academic practice	82 (19.62)

forty percent of the physicians were located in Bangkok and the central regions. About forty percent of the physicians specialized in internal medicine. Nearly two-thirds of the responders were residents in training.

Severe sepsis and septic shock management

Four hundred and six participating physicians (76.2%) have reported routine use of a quantitative resuscitation protocol and the septic patient care auditing system. These varied based on the type of hospital (General, 57.1%; Regional, 63.0%; University, 87.3%; Private 73.8%). Three hundred seventy-five physicians (71.3%) had screening guidelines for the patient at risk of sepsis. Fig. 1 demonstrates the resuscitation goal of line insertions in severe sepsis and for the management of septic shock. The resuscitation goals of the frequency grades were defined as "always" has used the parameters; urine output (70.9%), mean arterial pressures (MAP; 69.0%), central venous pressures (45.3%), central venous oxygen saturation (19.4%) and lactate levels (15.8%) or lactate clearance (8.4%). Nearly 80% of these "often and always" reached their resuscitation goals within 6 hours and had central line insertions in their patients. Arterial line insertions were inserted in half of the patients. However, pulmonary artery catheters were less popular "None and rarely" 87%. Most physicians' stated their use of sodium bicarbonate, corticosteroids and inotropic therapy (e.g. dobutamine) as "sometimes" in their practice. The median pH threshold for sodium bicarbonate administration was a value of 7.2 (interquartile range, (IQR) 2.84). The most frequent indication for inotropic infusion in sepsis was a suspected myocardial dysfunction (high CVP with a low cardiac output: 58.4%), hypoperfusion despite exhibiting an adequate volume and MAP (low $ScvO_2$ or poor lactate clearance; 35.7%), increasing cardiac output (16.5%), and the patients at the maximum limits of the vasopressors with an inadequate MAP (10.5%). However, approximately 10% of physicians never "none" used dobutamine during resuscitation of a septic patient.

Regarding the antimicrobial-antiseptic use and the microbial cultures' aspects in Fig. 2, approximately 80% of the physicians invariable await the results of the bacterial cultures prior to starting antibiotics. The majority of the physicians send aerobic cultures solely (81.5%). The majority of the physicians assayed routine fungal investigations rarely for suspected invasive candidiasis with the use of 1, 3 beta-D-glucan assays or mannan and anti-mannan

antibody assays (71.6%) or with the use of infection biomarkers [e.g. procalcitonin (65.3%)]. Selective oral decontamination (SOD) and selective digestive decontamination (SDD) has become unpopular in practical application (Fig. 2). Oral chlorhexidine gluconate rinsing for decontamination has been routinely used by 46.9% of physicians. However, 26.8% physicians were unaware of this practice. The most frequently selected empirical treatments for suspected gram negative, gram positive and fungal infections were the use of Carbapenem (53.8%), Vancomycin (93.6%) and Amphotericin B (86.1%) respectively as is seen in
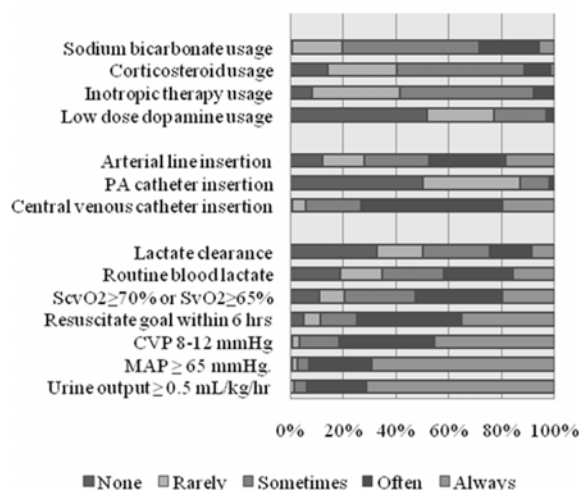

Fig. 1 Demonstrates resuscitation, line insertions and targets for severe sepsis and the management of septic shock (MAP = mean arterial pressure; CVP = central venous pressure; $ScvO_2$ = central venous oxygen saturation; SvO_2 = mixed venous oxygen saturation; PA = pulmonary artery).
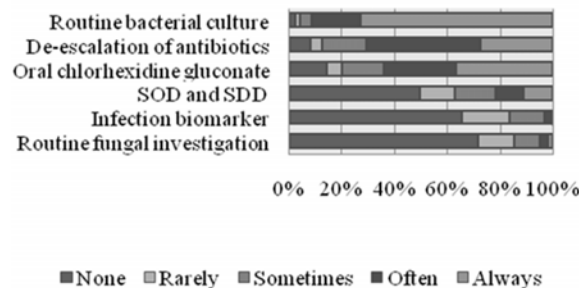

Fig. 2 Cultures and antimicrobial-antiseptic use septic patients (SOD = selective oral decontamination; SDD = selective digestive decontamination).

Table 3. These antimicrobial agents have been started within 1 hour in 87.7% of the cases. Empirical treatments were continued for less than 5 days in 67.3% of the cases and less than 7 days in 98.3% of the incidences (Table 3). Of these, approximately 70% of the patients ('often' and 'always' frequency) were able to de-escalate antibiotic or antimicrobial therapy (Fig. 2). The consensus of physicians (93.9%) has used clinical

observations and culture results for antimicrobial selection in this process (Table 3). In situations of persistent fevers after empirical antimicrobial therapy, most of physicians (67.3%) would physically investigate for the causes of the sepsis (Table 3). As for infectious source identification with the use of CT scans or ultrasound, 52.02% of the physicians ordered these tests within 12 hours and 85.8% within 24 hours.

Regarding intravenous fluids of choice and vasopressors, most of the physicians selected crystalloids as the initial fluid for resuscitation (Table 4). Less than 10 percent of the physicians polled used colloids during resuscitation (Fig. 3). Hydroxyethylstarch (HES) and 5% albumin use were comparable while gelatin was used less frequently (Fig. 3). The serum level target of albumin in sepsis patients were, at highest, 2.6-3.0 g/dL (40.3%) [2.0-2.5 (9.5%); 3.1-3.5 (35.1%); 3.6-4.0 (14.3%); >4.0 (0.8%)]. The two most common first line vasopressors prescribed were norepinephrine (NE, 69.6%) and dopamine (DA, 27.6) (Table 5). The most common second line vasopressor was epinephrine (20.9%).

The two primary, common indications for corticosteroid use as seen in Table 6, were unstable hemodynamics following adequate fluid and

Table 3. Empirical treatment on severe sepsis and septic shock

Empirical treatments	n (%)
Gram negative	
3rd generation cephalosporin	150 (28.6)
4th generation cephalosporin	39 (7.4)
Fluoroquinolone	10 (1.9)
Beta-lactam inhibitor	38 (7.3)
Aminoglycoside	5 (1.0)
Carbapenem	282 (53.8)
Gram positive	
Vancomycin	485 (93.6)
Linezolid	0 (0.0)
Teicoplanin	1 (0.2)
Daptomycin	0 (0.0)
Fosfomycin	32 (6.2)
Fungus	
Amphotericin B	447 (86.13)
Liposomal Amphotericin B	10 (1.93)
Fluconazole	53 (10.21)
Voriconazole	5 (0.96)
Caspofungin	4 (0.77)
Initial antimicrobial therapy	
Within 0.5 hr	153 (29.1)
Within 1 hr	308 (58.6)
Within 2 hrs	29 (5.5)
Within 3 hrs	14 (2.7)
No time limit	22 (4.2)
Duration of first empirical treatment	
Less than 5 days	352 (67.3)
Less than 7 days	162 (31.0)
Less than 10 days	5 (1.0)
Less than 14 days	4 (0.8)
De-escalation after culture result	
Clinical response and culture	492 (93.9)
Only clinical response	8 (1.5)
Only culture results	7 (1.3)
No de-escalation	17 (3.3)
Persistent fever after antimicrobial therapy	
Continue antimicrobial agents	9 (1.7)
Repeat culture	84 (16.0)
Discontinue antimicrobial agents	4 (0.8)
Searching causes	354 (67.3)
Expert consultations	75 (14.3)

Table 4. Initial fluid therapy selection for septic and traumatic shock

Fluid	Septic shock	Traumatic shock
0.9% NaCl	522 (98.9)*	278 (53.1)
Ringer lactate	-	242 (46.2)
HES	4 (0.8)	3 (0.6)
Gelatin	2 (0.4)	0 (0.0)
5% Albumin	0 (0.0)	1 (0.2)
Hypertonic saline	-	0 (0.0)

* crystalloid including both; 0.9% NaCl and Ringer lactate solution
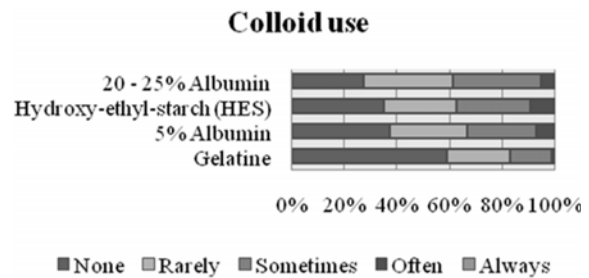

Fig. 3 Colloids used in severe sepsis and septic shock.

vasopressor therapy (67.7%) and low cortisol serum levels (38.8%). The median, cortisol serum, threshold level indicating steroid replacement therapy was 15 mg/dL (IQR; 5-19) as seen in Table 6. The majority of the physicians used hydrocortisone (96.4%) for this purpose and the median daily dose of hydrocortisone was 300 mg (IQR; 200-300). Approximately 50% of the physicians prescribed the hydrocortisone in divided doses to be administered every 8 hours and about one-third of the physicians administered the medication in continuous infusions. Ninety percent of the physicians tapered the steroids following hemodynamic stabilization (33.6% in 2-3 days, 30.0% in 3-5 days and 23.7% in 5-7 days; Table 6).

With regard to hemodynamic monitoring (Fig. 4), central venous pressures and fluid challenge tests were the two most common methods used. Less than 15 percent still use pulmonary artery catheters in their routine practice (Fig. 4). Pulse pressure variations (PPV) and IVC variations were the two most common methods for testing fluid responsiveness. Systolic pressure variations, plethysmographic variations, and stroke volume variations were used moderately while the passive leg raising test, and end expiratory occlusion were used "rarely or never" by Thai physicians (Fig. 4).

Hemorrhagic and traumatic shock

Although only 162 physicians (39.3%) have been certified in Advance Traumatic Life Support (ATLS), 311 physicians (75.6%) have reported following the ATLS guidelines for traumatic shock management. At the initial resuscitation, half of physicians gave large amounts of fluid boluses of 2,000 mLs (56.7%); almost half gave median amounts of fluid boluses of 500-1,000 mLs (40.4%) and only a few administered small fluid boluses of 100-200 mLs (3.0%). Almost all physicians initially resuscitated the patients with crystalloids (0.9% NaCl 52.8% and Ringer's lactate 46.5%). Blood

Table 5. Vasopressor therapy selection for septic and traumatic shock

Vasopressor therapy	Septic shock (1st line)	Septic shock (2nd line)	Traumatic shock
Dopamine	146 (27.6)	267 (50.8)	328 (63.1)
Norepinephrine	368 (69.6)	124 (23.6)	160 (30.8)
Epinephrine	7 (1.3)	110 (20.9)	22 (4.2)
Vasopressin	7 (1.3)	22 (4.2)	10 (1.9)
Phenylephrine	1 (0.2)	3 (0.6)	0 (0.0)

Table 6. Steroid therapy on severe sepsis and septic shock

Steroid therapy	n (%)
Indications (%)	
Unstable of hemodynamic after adequate fluid and vasopressor therapy	361 (67.7)
ACTH stimulation test to identify steroid responder	52 (9.8)
Low cortisol serum level	207 (38.8)
Never use	81 (15.2)
Serum cortisol level threshold (mg/dL) [median (IQR)]	15 (5-19)
Daily steroid dose in mg [n (%)/median (IQR)]	
Hydrocortisone	403 (96.4)/300 (200-300)
Dexamethasone	45 (10.8)/16 (12-20)
Methylpredisolone	12 (2.9)/60 (8-150)
Division of steroid in hours (%)	
Every 24 hrs	21 (4.7)
Every 12 hrs	15 (3.4)
Every 8 hrs	218 (49.1)
Every 6 hrs	49 (11.0)
Every 4 hrs	0 (0.0)
Continuous drip	141 (31.8)
Discontinue of steroid	
No tapering	56 (12.6)
Tapering in 2-3 days	149 (33.6)
Tapering in 3-5 days	133 (30.0)
Tapering in 5-7 days	105 (23.7)

transfusions have frequently been started in cases of massive blood loss. The indications were a hematocrit of less than 30% or hemodynamic instability after 2 L of crystalloid infusion (Fig. 5). In patients requiring massive transfusions, physicians used packed red cells (PRC) to fresh frozen plasma (FFP) in a ratio of 1:1 (34.1% of those surveyed), 1.5:1 (7.2%), 2.5:1 (17.5%), 5:1 (17.8%), and 8:1 (1.7%) respectively. Dopamine was the most commonly prescribed vasopressor in traumatic shock (Table 5). Central venous pressure lines were inserted in the 'often' and 'always' categories in 35.6%
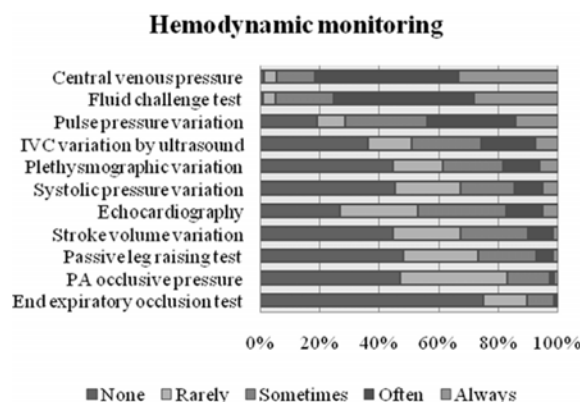

Hemodynamic monitoring

Fig. 4   Demonstrating hemodynamic monitoring in severe sepsis and septic shock management (IVC = inferior vena cava; PA = pulmonary artery).
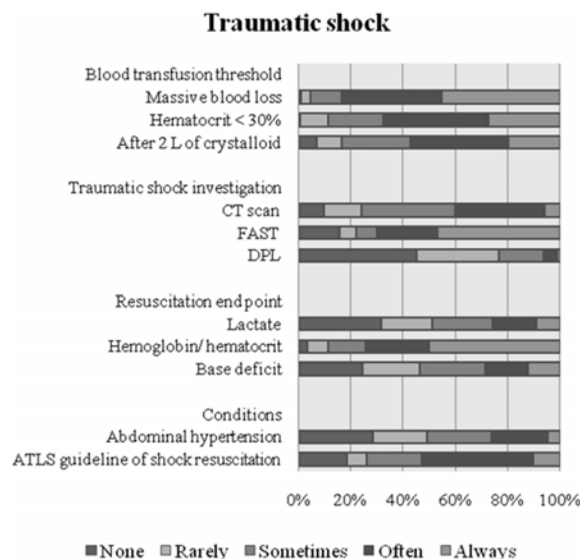

Traumatic shock

Fig. 5   Demonstrating traumatic shock management (ATLS = Advance traumatic life support; DPL = Diagnostic peritoneal lavage; FAST = Focus assessment sonography in trauma; CT = computer tomography; L = liter).

of the respondents' practices. Base deficits and lactate levels have been less frequently used for the resuscitation goals (Fig. 5). Hemoglobin and hematocrit have been the most frequently used evaluations following resuscitation (Fig. 5). The maintenance of a median systolic pressure level was at 90 (IQR 90-100) mmHg for non-traumatic brain injuries and 90 (IQR 90-120 mmHg for traumatic brain injuries. Focus assessment sonography for trauma (FAST) was the most commonly used investigative technique for traumatic shock (Fig. 5). Surgery had been performed within 30 min by 28.9% of the respondents and at 45 min (10.5%), 60 min (31.2%), 90 min (14.2%) and more than 90 min (15.2%) respectively. Abdominal hypertension monitoring was only routinely investigated and a concern for 25% of the physicians (Fig. 5).

Discussion

The present study is the first pragmatic survey on shock management in Thailand with a focus on septic and hemorrhagic shock. Although the evidenced based protocols for sepsis management could improve both the mortality and health care cost savings[5], implementation of these guidelines depends on hospital policy and many additional factors. These include quality improvement campaigns, collaboration with executive boards, the willingness of the health care provider to form rapid response teams, the hospitals' capacity levels and budget concerns. These were confirmed by the differences in the proportions of the use of quantitative resuscitation protocols. While 87.3% of participating physicians in University-based hospitals use these protocols, it has been shown that the protocols are in use in 57.1% and 63.0% of the general and regional hospitals, respectively.

Two of the shock resuscitation goals or targets are in addressing the parameters of hemodynamic measurements (e.g. CVP, MAP, PAOP, urine output) and tissue perfusion (e.g. lactate, $ScvO_2$, SvO_2). Established septic campaign guidelines suggest the monitoring and use of both of these variables for evaluating the adequacy of resuscitation[2]. However, hemodynamic parameters in the resuscitation of patients with septic or traumatic shock have been preferred over perfusion parameters on this survey with marked significance (Fig. 3). The previous survey of lactate levels and $ScvO_2$ (ICU RESOURCE I) have demonstrated a discordance of the availability and use of the necessary equipment ('moderate' density of equipment availability but only a 'sometime' use)[6].

Unfamiliarity and a lower concern for tissue perfusion in every day practice may be a factor in this finding. Pulmonary artery catheters (PAC) have rarely been used in current practices in Thailand. Previous evidence of the lower benefits of PACs as opposed to the risks of insertion might possibly be of the reasons and an explanation for this finding[7,8].

Guidelines recommending early, complete microbial identification, including aerobic cultures, anaerobic cultures, fungal cultures, immunologic assays (e.g. 1, 3 beta-D-glucan assays or mannan and anti-manna antibody assays in suspected invasive candidiasis) and the use of infective biomarkers (e.g. procalcitonin levels)[2]. The purpose of these culture results are for the obtaining of data for early, appropriate and effective antimicrobial prescriptions for improved outcomes[9]. With limitation and availability issues, most physicians' order aerobic cultures (81.5%) solely prior to starting antimicrobials as has been seen in this survey. Interestingly, 87.7% of the participating physicians started antimicrobial therapy within 1 hour (29.1% starting within 0.5 hour) of admission. Most selected broad-spectrum antibiotic therapy (Carbapenem for gram-negative bacteria, Vancomycin for gram-positive bacteria and Amphotericin B for fungus; Table 3). The duration of these empiric treatments was less than 7 days for 98.3% of the patients and less than 5 days for 67.3%. This would be lower following the culture results and clinical responses (Table 3). Prophylactically, SOD and SDD demonstrate better outcomes in special situations and for certain patients[10,11]. However, it has been only rarely implemented and this is in direct contrast with chlorhexidine gluconate oral rinsing (Fig. 2) that has been shown to be more common.

Regarding the intravenous fluids used in resuscitation and the vasopressors prescribed for use in septic and traumatic shock, crystalloids have been the initial fluid of choice. Ringer's lactate solution has been shown to be preferable over 0.9% sodium chloride in the trauma patient. Colloid use has been used as a later consideration. Albumin and HES were the two most common. Although there were no differences in the outcomes with the initial resuscitation with saline or albumin, ongoing trials of albumin use in ICUs (ALBIOS) have shown that there is a need to consider the patients' albumin levels prior to administering albumin. Administration of albumin should be considered if the serum levels are <3.0 g/dL[12,13]. The goals for the infusion of albumin in this survey were to maintain serum levels of 2.6-3.0 g/dL (40.3%) to 3.1-3.5

g/dL (35.1%). While norepinephrine (NE) has been suggested as the first line treatment for hemodynamic instability in the septic patient, NE is still controversial for use in the trauma patient[2,14,15]. In this survey, NE is preferred for the septic patient and dopamine (DA) is the drug of choice for trauma patients.

Steroid use in sepsis and septic shock patients is a current issue and is practiced with its dynamics based on indications, dosages and types of steroids[2,16,17]. Hydrocortisone is the most common drug used by Thai physicians with two common indications for hemodynamic instability following adequate resuscitation or low serum levels. The serum levels of cortisol of less than 20 µg/dL occurred in approximately 30% of septic patients based on information from one cohort study. Although this lower level threshold had shown a higher mortality rate, there were no significant differences[18]. However, 81% of the mortalities occurred in patients with serum cortisol levels of more than 45 g/dL[18]. The threshold for the initiation of corticosteroids here in Thailand varies but the median level is considered to be 15 µg/dL (IQR 5-19). The two common prescriptions for hydrocortisone were 300 mg in divided doses administered every 8 hours or continuous infusions. If no indications for a steroid infusion were found, 12.6% of the physicians discontinued the steroids without tapering. In cases requiring tapering, the duration was proportional (3 days for 33.6% of the cases; 5 days in 30.0% and 7 days for 23.7%).

New methods have been developed which include fluid responsiveness and echocardiography assisted techniques for hemodynamic monitoring during the resuscitation of patients in shock[19,20]. However, old fashioned, reliable hemodynamic and preload assessment with central venous pressures and fluid challenge tests are still the principle methods being used by Thai physicians (Fig. 4). Pulse pressure variations and IVC variations are the two common primary hemodynamic monitoring methods. Stroke volume variation, passive leg raises and end expiratory occlusion tests are methods that are currently, albeit rarely, used.

Regarding the treatment of traumatic shock from the perspectives of those responding, only 70% of physicians have reported following the ATLS guidelines for resuscitation even though ATLS has been established in Thailand for more than 10 years now[21]. In cases requiring massive blood transfusions, a common ratio of PRC to FFP is 1:1 (34.1%). This is considered the proper threshold protocol for massive

transfusions for improving the mortality risks[22]. However, there are rarely used parameters for the assessment of tissue perfusion such as lactate levels and base deficits during the resuscitation period. FAST is preferred over DPL as an investigative tool in the current trends for the care of the traumatized patient.

The present study is the primary and the largest pragmatic survey of shock management ever done in Thailand. However, there are some inevitable limitations. First, there is an unequal distribution of participating physicians. Nearly sixty percent of them are working in university-based hospitals and their status is as 'residents in training'. Therefore, the answers might be more representative of an academic rather than a service environment. Second, frequency grading in this study is defined by the estimation of the patients' proportions. Recall bias could possibly occur. Third, the background of the physicians and their specialties can possibly distort the results. Nearly forty percent of physicians are from internal medicine and they may possibly be unfamiliar with trauma patients and problems of massive bleeds. Nevertheless, the results of this study may reflect the overall attitudes and tendencies of shock management here in Thailand.

Conclusion

Most physicians manage shock by established protocols. Hemodynamic goals are preferred over standard tissue perfusion targets. Early antimicrobial therapy and de-escalation are routine practices and are normally done without the use of infective biomarkers. Crystalloids are preferred over colloids for the initial resuscitation. CVPs and fluid challenges are more popular than current methods that measure fluid responsiveness with pre-load assessments. Hydrocortisone is the most common steroid prescribed in septic shock, but the threshold for the initiation of therapy, the frequency and methods of discontinuation vary.

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Potential conflicts of interest

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การสำรวจแนวทางการรักษาผู้ป่วยที่มีภาวะช็อกในประเทศไทย (Thai-shock survey 2556)

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วัตถุประสงค์: เนื่องจากยังไม่มีข้อมูลเกี่ยวกับแนวทางการรักษาภาวะช็อกของแพทย์ที่ปฏิบัติงานในประเทศไทย วัตถุประสงค์ของการศึกษานี้ เพื่อระบุลักษณะของการดูแลรักษาผู้ป่วยที่มีภาวะช็อกจากการติดเชื้อและจากการเสียเลือดในประเทศไทย

วัสดุและวิธีการ: แบบสอบถามจำนวน 2,000 ชุด ได้ส่งไปยังแพทย์ที่มีส่วนเกี่ยวข้องในการดูแลผู้ป่วยช็อก ในโรงพยาบาลทั่วประเทศไทย แบบสอบถามประกอบด้วยคำถาม จำนวน 58 หัวข้อ ที่เกี่ยวกับทุกแง่มุมของภาวะช็อกจากการติดเชื้อและการเสียเลือด มีการกำหนดระดับของความถี่เป็น 5 ระดับ โดยแบ่งตามสัดส่วนของผู้ป่วยที่ได้รับการรักษาในเวชปฏิบัติ

ผลการศึกษา: ระหว่างเดือนเมษายน ถึง สิงหาคม พ.ศ. 2556 แบบสอบถามจำนวน 533 ชุด (ร้อยละ 26.7) ถูกส่งกลับมาทำการวิเคราะห์ ในประเด็นการรักษาผู้ป่วยที่มีภาวะช็อกจากการติดเชื้อ แพทย์จำนวน 406 คน (ร้อยละ 76.2) ตอบว่ามีการใช้แนวทางปฏิบัติโดยจำนวนปัสสาวะที่ออก ระดับความดันโลหิต และ central venous pressure (CVP) เป็นตัวแปรที่ใช้ในการติดตามระหว่างการช่วยฟื้นชีพมากกว่าการใช้ระดับ central veous oxygen saturation หรือระดับของ lactate ในเลือดประมาณ ร้อยละ 80 ให้ระดับความถี่ "บ่อยและเสมอ" ในการช่วยฟื้นชีพสำเร็จภายใน 6 ชั่วโมง แพทย์ส่วนใหญ่ (ร้อยละ 65.3) ไม่เคยใช้ procalcitonin การให้ยาปฏิชีวนะอย่างครอบคลุม เริ่มให้ภายในชั่วโมงแรกประมาณร้อยละ 87.7 และประมาณ ร้อยละ 67.3 ให้ต่อเนื่องไม่เกิน 5 วัน ก่อนลดระดับของยาปฏิชีวนะลง สารน้ำที่นิยมในระยะเริ่มแรกคือ น้ำเกลือ (crystalloid) (ร้อยละ 98.9 ในการติดเชื้อ ร้อยละ 99.3 ในอุบัติเหตุ) ยาตีบหลอดเลือด (vasopressor) ที่นิยม คือ norepinephrine ในผู้ป่วยติดเชื้อ (ร้อยละ 69.6) และ dopamine ในผู้ป่วยอุบัติเหตุ (ร้อยละ 63.1) ค่ามัธยฐานของระดับ cortisol ในเลือดที่จะให้ steroid คือ 15 มิลลิกรัมต่อเดซิลิตร (5-19) แพทย์เกือบทั้งหมดให้ hydrocortisone (ร้อยละ 96.4) โดยมีค่ามัธยฐานคือ 300 มิลลิกรัมต่อวัน (200-300) ประมาณร้อยละ 50 แบ่งให้ทุก 8 ชั่วโมง และร้อยละ 31.8 ให้แบบหยดต่อเนื่อง การหยุดยาดังกล่าวมีความแตกต่างกัน (ร้อยละ 33.6 หยุดยาใน 2-3 วัน) การวัดระดับ CVP และการทดสอบการตอบสนองด้วยการให้สารน้ำ (fluid challenge) เป็นวิธีที่นิยมใช้ในการประเมินความต้องการสารน้ำมากกว่าการวัดการตอบสนองแบบใหม่ๆ และแพทย์น้อยกว่า ร้อยละ 15 ยังคงมีการใช้สายสวนในหลอดเลือดแดงพัลโมนารี สำหรับผู้ป่วยช็อกจากการเสียเลือด ถึงแม้ว่าจะมีแพทย์จำนวนเพียง 162 ราย (ร้อยละ 39.3) ผ่านการอบรมการช่วยชีวิตขั้นสูงในผู้ป่วยอุบัติเหตุแต่แพทย์จำนวน 311 ราย (ร้อยละ 75.6) รายงานว่ามีการใช้หลักปฏิบัติของการอบรมดังกล่าวในผู้ป่วยอุบัติเหตุเสมอในกรณีที่มีการให้เลือดในจำนวนมาก แพทย์นิยมให้สัดส่วนของเลือดต่อน้ำเลือดในอัตราส่วน 1:1 (ร้อยละ 34.1) การใช้อัลตร้าซาวด์เป็นที่นิยมในการสืบค้นภาวะช็อกในผู้ป่วยดังกล่าว

สรุป: ส่วนใหญ่ของแพทย์ให้การรักษาภาวะช็อกด้วยแนวทางปฏิบัติ เป้าหมายเกี่ยวกับระบบไหลเวียนเป็นที่นิยมมากกว่า

เป้าหมายของการกำซาบในเนื้อเยื่อ (tissue perfusion) การให้ยาปฏิชีวนะในระยะแรกและลดระดับยา ลงมีการปฏิบัติ โดยทั่วไปและไม่มีการใช้สารส่อการติดเชื้อ (infective biomarker) น้ำเกลือนิยมมากกว่าคอลลอยด์ ในการช่วยฟื้นชีพ ในช่วงแรกการวัด CVP และการทดสอบการให้สารน้ำยังคงเป็นวิธีที่นิยมมากกว่าวิธีใหม่ๆ hydrocortisone เป็นยา steroid ที่ใช้ บ่อยที่สุดในผู้ป่วยติดเชื้อแต่จุดเริ่มต้นของการให้ยา ความถี่และการหยุดยายังมีความแตกต่างกัน