UTILITY OF QSOFA AND SIRS SCORE IN PREDICTING THE OUTCOME IN PATIENTS WITH SUSPECTED SEPSIS PRESENTING TO EMERGENCY ROOM IN FIRST 24HRS; AN OBSERVATIONAL STUDY

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ABSTRACT

INTRODUCTION

Sepsis is most serious illness assessed based on cohort prospective study at population level (WHO2018 report). In past four decades SIRS criteria have been used to assess the disease condition. However, these impedance criteria is not useful for the researcher for inception of new therapy. In Indian context, very limited literature is available to prediction of accurate determinants of qSOFA and SIRS. As for as assessment concern, the present study attempt to correlate the utility of qSOFA and SIRS score in the outcome among patients with suspected sepsis presenting in Emergency Room in the first 24 hours.

METHODS

An observational time-bound hospital-based perspective study was conducted at Department of Emergency Medicine PESIMSR, Kuppam, and Andhra Pradesh. The study was conducted with a sample size of 150 patients, who presented with features suggestive of sepsis. Study conducted during the period Jan 2018 to Jun 2019. The inclusion and exclusion criteria were employed. Data was collected from pre- tested questionnaires. Data analysis was done by using SPSS statistical software. Descriptive and multiple logistic regression was used to test the hypothetical statements.

RESULTS

In the present study, mean age of the cases was 45.21 $\pm$ 2.31 years (IQR 30-60 years ; CI95% 29.85 -62.22 years, odds 5.22). Male gender predominated with (57.3%) with sex ratio was 1:1.30. At the time of presentation (96%) of cases were showed Heart rate > 90 beats per minute, (4%) cases were seen Heart rate of fewer than 90 beats per minute. More than half of the patients (56%) were Hypotensive at the time of presentation and Tachypnea was (96%); RR >22 per minutes. Half of the cases were Hyperthermic, and rest were Normothermic, with minority (2.7%) shows Hypothermia. Only (30%) of patients were Hypoxic condition. Almost, all three-quarters of Patients had altered sensorium while the rest of the cases were normal GCS. The majority of patients (80%) cases raised total counts, while leucopenia (15%). The Blood Lactate was high in half of the patients; it was seen very high in one quarter and normal in another quarter respectively. Three-quarters of patients did not require either Mechanical Ventilator or Vasopressor support. Total (38%) cases were required more than six days for therapy in ICU and (72%) of cases were discharged from the hospital while 29(19.33%) cases were expired within 24hours of admission, and the remaining cases of 13 (8.66%) is expired after 24 hours. Half of the patients showed 2 points according to qSOFA, and similar number shows 3 points, according to SIRS. Total (1.3%) of cases with SIRS and did not satisfy the qSOFA, while only (0.7%) meet qSOFA criteria. An equal number of patients were shows higher possible scores and found to be statistically insignificant ($p > 0.01$; odds 1.33). There is no satisfactory significant

correlation between qSOFA and Mortality rate within 24hours

CONCLUSION

Our findings revealed that, the qSOFA is better predictor when compared to SIRS criteria for predicting ventilator-free days and the need for vasopressor supports & organ dysfunction-free days. Since, SIRS criteria is good predictor on the estimation of mortality rate in emergency situation. These findings should be taken into account and it may helpful for clinicians to advance gain for further insight diagnosis, usefulness of qSOFA had better planning for patient management.

KEYWORDS: qSOFA, SIRS, prediction, mortality rate, freedays

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INTRODUCTION

The Sepsis remains significant burden of disease in medical research [3]. Various studies, including a recent meta-analysis research findings were estimated annual global incidence of Sepsis is 2.30 millions and mortality was drew up to 0.80 millions [1-2]. It has been known that long-term physical, cognitive, and psychosocial morbidity is associated with survival following sepsis and mortality rate shoot up to 2 years after the intervention [3-6]. Diagnostic criteria that are accurate and definitions have a critical role in the Emergency room, providing basic assessment tools for research beginners and policy makers for implementation of policy. From the literature we studied that , the sepsis is not an pro inflammatory aspects which involves response of anti-inflammatory [16]. In the advent of SIRS criteria sensitivity of predictors shows insufficiently to assess the infected patients at higher risk level when the cases shows complicated .Many literature have cited worldwide , sepsis is viewed organ dysfunction caused by a deregulated infection response [18-20]. In this marginal research gap, we intended to compare qSOFA and SIRS for predicting adverse outcomes of patients with suspicion of sepsis in the Emergency Room.

METHODS

The prospective study was conducted (besides with time-bound hospital-based observational study) from Jan 2018 to Jun 2019 at Department of Emergency Medicine, PESIMSR, Kuppam, Andhra Pradesh. A total 150 Adult patients presenting with clinical attributes on sepsis , suspected cases were presenting to Emergency Room .All suspected cases were considered for the study relayed upon the primary admission over a period of 18 months [qSOFA and SIRS Criteria calculated].The following inclusion exclusion criteria was employed for recruitment of patients Inclusion Criteria; All consecutive adult patients aged between 18 to 59 years with known suspected cases of Sepsis, Patients satisfy the criteria for sepsis and septic shock based on QSOFA and SIRS scores , Exclusion Criteria; Age <15years; Patients in whom there are technical difficulties in measuring parameters accurately and Patients presenting with a confounding diagnosis along with the primary diagnosis of Sepsis like Acute Coronary Syndrome, Diabetic Ketoacidosis, Burns, Trauma, Patients Requiring Immediate Surgical Intervention. All cases were admitted to Emergency department and evaluated according to Standard protocols and treating Physicians discretions; q SOFA AND SIRS was determined and tabulated accordingly

Ethical issues

Institutional ethical clearance was obtained in accordance with standard format. The study started at highest accuracy for managing patients with any overlapping flow or recruitment.

Data Analysis and Statistical Methods

Collected data was analysed by using SPSS statistical software , Descriptive Statistics and multivariate analysis was done to test the hypothetical results. Data was also represented using appropriate diagrams like a bar diagram, pie diagram, and box plots.

Results

A total of 150 people were included for the study. The mean age in the study population was 45.13 ± 1.5 years with the older age was 82 years. Majority (52%) population age between 30 to 60 years (IQR 29.31-62.58 years) and (38%) were > 60 years. Males constituted 57.3(80.0%) and the remaining 64(42.7%) were females. Fever (77%) is the most frequent presenting complaint followed by a cough and difficulty in breathing (65%) and vomiting and loose stools (24%), decreased urine output and burning micturition (22%), altered sensorium (12%). Among the study population 26 (17.3%) participants were Business people, 10 (6.7%) participants were labourer 23(15.3%) participants were farmers 15(10%) participants were jobholder 07 (4.7%) participants were retired employee 4 (2.7%) participants were a student and 39 (26%) homemakers (Table 1.1).

Table 1.1: Significance of demographic variables (n=150)

	Age(years)	No (%)	Odds	CI-95%	P-value
a.	1-30 years	15 (10%)	0.93	8.56-11.22	p>0.01
b.	30-60years	78 (52%)	5.63	42.01-54.99	P<0.01
c.	Above 60 years	57(38%)	8.14	31.21-42.33	P<0.01
Gender					
a.	Male	86(57.30%)	0.79	53.15-62.89	p>0.01
b.	Female	64(42.70%)	0.98	40.22-46.58	p>0.01
Occupational Status					
a.	Businessman	26(17.30%)	3.65	15.17-20.96	P<0.01
b.	Labour	10(6.70%)	0.97	5.42-7.58	p>0.01
c.	Farmers	23(15.30%)	2.55	9.63-17.55	P<0.01
d.	Home Stay	26(17.30%)	3.01	13.15-19.63	P<0.01
e.	Job Holder	15(10.0%)	1.25	7.85-12.58	P<0.01
f.	Retired Employee	07(4.70%)	0.25	3.65-6.55	p>0.01
g.	Students	04(2.70%)	0.36	1.25-3.17	p>0.01
h.	House Wife's	39(26.0%)	4.52	21.22-27.58	P<0.01

SBP/DBP blood pressure was recorded systematically, study found that , out of 150 subjects , 84 cases (56%) were Hypotensive, 62 (41.3%) cases were Normal and 4 (2.7%) is Hypertensive. Heart Rate 144 (96%) were <90, and 6 (4%) were >9 pulse per minutes; Respiration rate 4.0% cases were shows normal value and it was seen statistically significant (p<0.01). 15(10%) belongs to below 30 years of age group,78 (52%) belongs to 30-60 years age group, and 57 (38%) belongs to above 60 years of age group.

Figure 1.1: SBP/DBP distribution of 150 subjects

Distribution of temperature normal (46.0%); Hyperthermia (51.30%) and hypothermia (2.70%); SpO₂ >90 (70%), <90 (30%); GCS Abnormal (72.%); Total Count 4000-12000 cells/cumm (15.30%); >12,000 cells/cumm (80.0%); <4000 cells/cumm (4.70%), Clinical variable according to the Need of mechanical ventilator, out of 150, 108 (72%) were No, and 42 (28%) was Yes. Clinical variable according to the Number of ICU Days, out of 150, 57 (38%) were > 6 Days, is 49 (32.7%) were 3-6 Days, and 44 (29.3%) were 1-3 Days which includes death within 24 hours. according to the Death & Discharge, out of 150, 108 (72%) were Discharged, are 29 (19.3%) were Death within 24 Hrs, and 13 (8.7%) were Death after 24 Hrs.

Figure 1.2: Frequency and percentage distribution of Need for vasopressor support

The above table and graph show the Clinical variable according to the Need of vasopressor support, out of 150, 99

(66%) were No, and 51 (34%) was Yes.

Figure 1.3: Need for mechanical ventilation

Table 1.2: Frequency and percentage distribution of qSOFA score

qSOFA Score		SIRS		P-value
Score	No (%)	Score	No (%)	
0	2 (1.30%)	1	1 (0.70%)	0.632
1	15(10.0%)	2	22(14.70%)	0.073
2	76(50.70%)	3	70(46.60%)	0.012
3	57(38.0%)	4	57(38.0%)	0.036

From Table 1.2 , the able and graph shows the Clinical variable according to the q SOFA, out of 150 ,76 (50.7%) were 2, are 57 (38%) were 3, are 15 (10%) were 1. and 2 (1.3%) were 0.

Table 1.3: shows association of death with qSOFA (n=150)

q SOFA	Death & Discharge						Chi-square	
	Discharged		Death within 24 Hrs		Death after 24 Hrs and during the hospital stay		P-value	Results
	F		F		F	%		
0	2 (1.9%)		0(0.0%)		0(0.0%)	0%	0.250	Not Significant
1	11(10.20%)		2(6.90%)		2(15.40%)	15.4%		
2	58(53.70%)		10(34.50%)		8(61.50%)	61.5%		
3	37(34.30%)		17(58.60%)		3(23.10%)	23.1%		

The above Table 1.3 shows that , the association of 150 samples of q SOFA, analysis was employed to assess the significance relation between Death & Discharge associated q SOFA score, and it was found to be insignificant at $P > 0.05$.

Table: 1.4: Shows association of death & discharge with SIRS (n=150)

SIRS	Death & Discharge						Chi-square	
	Discharged		Death within 24 Hrs		Death after 24 Hrs		P-value	Results
	F	%	F	%	F	%		
1	0	0%	0	0%	1	7.7%	*0.028	Significant

2	16	14.8%	6	20.7%	0	0%		
3	50	46.3%	12	41.4%	8	61.5%		
4	42	38.9%	11	37.9%	4	30.7%		

Above Table 1.4 revealed that, the 150 samples with their SIRS, Univariate analysis was used to determine the relation between death & discharge of SIRS score, and it was showed to be statistically significant at $P < 0.05$.

DISCUSSIONS

Sepsis is significant cause of morbidity and mortality globally [15]. An infinite number of cases get admitted annually at worldwide, because sepsis is leading to a high number of deaths (30%) mortality absurd annually [25]. Majority of the cases who suffering from sepsis is admitted to the hospital in emergency department [6]. An early identification and management of sepsis by effective treatment and management to lower mortality rate [29-30]. An effective strategy for improving sepsis management to detect the manipulation of treatment strategies is need base in existing situation , because high rate of mortality recorded in emergency room globally. A newer tool is important to magnificent the death rate , Eamon P Raith et al. studied the prognostic accuracy of the SOFA score along with the SIRS Criteria and qSOFA Score for In-hospital mortality among adults with Suspected infections in the Emergency room [21]. Ari Moscovitz et al. studied qSOFA and SIRS as Predictors of Critical Care Intervention among Patients with Suspected Infection [22]. Jianjun Jiang et al. studied Head-to-head comparison of qSOFA and SIRS criteria in predicting the mortality of infected patients in the emergency department [13]. The mean age among the study population was 45 ± 15 , with the oldest being 82 years. The majority (52%) of the study population was between 30 to 60 years, and (38%) were > 60 years. In a study done by April et al. 2017. Total 42, the median age was 67 years. In a study by Askim et al. 45, the mean age was 62 ± 12 years. In another study by Finkelstein et al., who have assessed a Comparison of the capacity of discrimination of qSOFA versus SIRS criteria for predicting in-hospital deaths and, the mean age was 64 years. In a study by Kim et al who have assessed the Predictive Performance of qSOFA as a screening tool for sepsis, mortality, and ICU admission, the mean age of the study population, was in there were 54 years with the range of 45-66 years which is slightly higher than our study. In another study by Bhat et al, the mean age of the subjects was 63 ± 17.9 years. In another study by Tirado-Sanchez et al., the mean age of patients with severe sepsis was 31.27 ± 8.21 years. The low mean age in the current study might be a due chance. Another possibility is that due to the poor economic conditions of the rural population, everyone cannot afford tertiary level care. The earning members of the family will be given priority, and they are preferentially taken to higher levels of care [1-9]. This leads to inappropriately high levels of middle-aged populations in the samples from tertiary care hospitals. Among the study population, demographic variable according to the age group of 150 samples, among them 15(10%) belongs to below 30 years of age group, 78 (52%) belongs to 30-60 years age group, and 57 (38%) belongs to above 60 years of age group. In the current study, Males constituted 57.3(86%) of the study population, and the remaining 42.7% (64) were females. In a study by Henning et al. performance of qSOFA in predicting in-hospital mortality, the proportion of males and females was similar (50%), as compared to the male preponderance in our study. In a study by Hwang et al. the proportion of males (56.4%), which is almost similar to the current study. In a study by forwarding et al. Comparison of prognostic performance of qSOFA, SIRS, and SK criteria, the proportion of males and females (53.77%) and (44.23%) respectively [30,31]. In a study by Quinten et al., males constituted (56.1%) of the study population. Overall most of the studies are having a male preponderance in case distribution, which is reflected in the current study. Two explanations can be given for this preponderance. One, males usually go out to work and socialize, making them prone to infections, which

are sometimes virulent. Second, in rural areas, males are given more importance and are preferentially brought to higher levels of care. In the current study population the Heart Rate, out of 150, 144 (96%) were <90, and 6 (4%) were >90. To the SBP/DBP, out of 150, 84 (56%) were Hypotensive, are 62 (41.3%) were Normal, and 4 (2.7%) were Hypertensive. The Target Map, out of 150, 83 (55.3%) were abnormal, and 67 (44.7%) were Normal. The Respiratory Rate, out of 150, 144 (96%) were abnormal, and 6 (4%) were Normal. In Temperature, out of 150, 77 (51.3%) were Hyperthermia, are 69 (46%) were Normal, and 4 (2.7%) were Hypothermia. The GCS, out of 150, 108 (72%) were Abnormal, and 42 (28%) were Normal. The Total Count, out of 150, 120 (80%) were >12,000, are 23 (15.3%) were 4000-12000, and 7 (4.7%) were <4000. In this study Need of vasopressor support, out of 150, 99 (66%) required vasopressor support, and 51 (34%) doesn't need and to the mechanical ventilator, out of 150, 108 (72%) were kept on mechanical ventilator support, and 42 (28%) were not. In mortality, out of 150, 108 (72%) were Discharged, are 29 (19.3%) were Death within 24 Hrs, and 13 (8.7%) were Death after 24 Hrs. The study, comprised of high-mortality (19%) patients within 24 hrs and 9% after 24 hrs, 72% of patients discharged after prolonged ICU stay. In the current study out of 150 patients, One hundred and forty-nine (99%) included patients were admitted to the ICU within less than 24 hours after their presentation in the emergency department, while the remaining one patient was hospitalized in the wards for more than 24 hours and then shifted to ICU.

CONCLUSIONS

Summing of the results concludes that, the qSOFA better criteria when compared to SIRS . These findings should be taken into account and may useful for clinicians to gain further insight diagnosis and especially useful for the qSOFA score assessment and better planning for management of cases.

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