ESTIMATION OF MORTALITY RATE OF QSOFA AND SIRS

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ABSTRACT

INTRODUCTION

In Medical science, sepsis syndrome is characterized signs of infection and manifestation in relation with host response. As per the literature, it is the primary cause of mortality morbidity from infection enlisted in Medical emergency. The clear definition of sepsis has been varied throughout the preceding decades. An intervention of Sepsis is currently described life threatening organ dysfunction, represented by increase of lease two or more points in the Sequential Organ Assessment (SOFA) score. In Indian context, a very limited number of research papers cited to address research gap for estimation of predictors accurately at population level. In this research gap, the present research study aims to assess the predictors of qSOFA and SIRS

METHODS

The study was a prospective besides with time-bound hospital-based observational study was conducted from Jan 2018 to Jun 2019 at Department of Emergency Medicine, PESIMSR, Kuppam, Andhra Pradesh. A total 150 adult patients presenting with clinical features of 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].

RESULTS

Binary logistic regression was applied for estimation of area under curve and accurate prediction of sepsis cases at early stage, the results found that Increase in qSOFA Score ≥ 2 was statistically significant AUC 0.82; CI 95% 0.62-0.87; specificity 80% and sensitivity was 80.11 %. The association of 150 samples with support of Mechanical Ventilator, the descriptive statistics was used to know the significance of the correlation between qSOFA with respect to Mechanical Ventilator, results was found to be statistically correlated.

CONCLUSIONS

Summing of the results concludes that, both qSOFA and SIRS subjects were showed positively correlated with higher rate of life supporting treatment and directly proportional to number of hospital stay to reduce the morbidity and mortality. The research study coveted to predict the accurate infection and symptoms at early stage

KEYWORDS: qSOFA, SIRS, AUC, Organ dysfunction, GCS

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INTRODUCTION

Sepsis is a syndrome with multiple infection and manifestation in response clinical settings. As per the medical ethics, the

infection is delirious and cause primary infection and incremental increased the medical emergency .The intervention of sepsis is largely depends on the treatment and mechanisms of patients managing with life supporting treatment .Many literature reviewed to addressed the mortality and morbidity at population level, sepsis is life threatened dysfunction and its is represented by an two points increase in the Sqfa assessment score. Disease predictors is very important for the clinician to draw accurate clinical decision about the exposed population . Some of the assessment would be encompasses to highlights the signs and symptoms. In this vein Qsofa Score is used to escalates the severity of the disease . Many literature cited worldwide to addresses the key issues of both (sqofa and SIRS) .Intervention remains ambiguous to manage the patients without severity assessment in Department of emergency. Accurate prediction method defines various characteristics on selected parameters, viz. respiratory rate, oxygen level , body temperature , heart rate and AVPUS score with maximum of twenty points . Clinically we used the following criteria , the subjects meet two or more of the following parameters , respiratory rate of the cases ≥ 22 breaths per minutes , altered mental status and systolic blood pressure ≤ 100 mm/hg. Similarly in case of SIRS , the criteria would meet the followings criteria , temperature < 36 degree centigrade or > 38 degree centigrade , heart rate of subjects bears > 90 beats per minute and RR > 20 breaths per minutes. In Indian scenario ,very limited number of literature cited for addressing the research gap of estimation of predictors accurately at population level[18] . In this research gap, the present research study aims to extrapolate the predictors of qSOFA and SIRS

METHODS

The present study was done prospective basis with time-bound. Hospital-based observational study was conducted from Jan 2018 to Jun 2019 at Department of Emergency Medicine, PESIMSR, Kuppam, Andhra Pradesh. A total 150 adult patients presenting with clinical characteristics of Sepsis and shock and suspected cases were recruited at ED .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 presenting to Emergency Room with suspected SEPSIS, Patients satisfy the criteria for sepsis and septic shock based on QSOFA and SIRS scores , Exclusion Criteria; Age less than 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 Patients were admitted in Emergency department with known suspected sepsis, it was assessed in accordance with Standard protocols and treating by the Physicians Discretions; parameters of q SOFA AND SIRS was calculated and tabulated.

Ethical Issues

An Institutional ethical Clarence was obtained from the Competent authority ,after obtaining IE we started the study at greatest accuracy . Patients selection and recruitment was done on the basis of standard operating protocol and regularity guidelines. Collected data was analyzed by using R -statistical software .Logistic regression and Survival analysis was done for estimating the predictors of qSOFA and SIRS respectively.

Results

Table 1.1: 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 1.1 shows that , the association of 150 samples with their SIRS criteria for likelihood of mortality and survivability , the descriptive statistics was used to test the significance ($p < 0.05$) and explore any significant association between mortality & discharge cases of SIRS score or criteria ,results found that , there is significant difference was found between the SIRS criteria to control death and exponentially move survival rate of the sepsis cases accordingly ($P < 0.05$).

Table 1.2: Shows association of qSOFA with need of vasopressor [n=150]

The need of Vasopressor	q SOFA								Chi-square	
	0		1		2		3		P-value	Results
	F	%	F	%	F	%	F	%		
1	2	100	15	100	64	84	18	31.6	*P<0.001	Significant
2	0	0	0	0	12	15	39	68.4		

The above Table 1.2 shows that, the association of 150 samples with need of Vasopressor, the correlation was estimated by chi-square analysis. Study reveal that, there is positive association between qSOFA besides with need of Vasopressor and it was seen statistically significant at $P < 0.05$.

Table 1.3: Correlation between qSOFA with need of mechanical ventilator [n=150]

Need of Mechanical Ventilator	q SOFA								Chi square	
	0		1		2		3		P-value	Results
	F	%	F	%	F	%	F	%		
1	2	100%	15	100%	61	80.3%	30	52.6	*P<0.001	Significant
2	0	0%	0	0%	15	19.7%	27	47.4		

The above Table 1.3 shows that, the association of 150 samples with support of Mechanical Ventilator, the paired and unpaired statistics was used to know the significance of the correlation between q SOFA with respect to Mechanical Ventilator, results was seen statistically significant at $P < 0.05$.

Table 1.4: shows association of q SOFA with number of days ICU

No of ICU Days	q SOFA								Chi-square	
	0		1		2		3		P-value	Results
	F	%	F	%	F	%	F	%		
1	1	50%	7	46.7%	8	10.5%	28	49.1%	*P<0.001	Significant

2	1	50%	6	40.0%	30	39.5%	12	21.1%		
3	0	0%	2	13.3%	38	50.0%	17	29.8%		

The above Table 1.4: shows that , the association of 150 samples correlation was done to explore the number of ICU Days and q SOFA , the paired t test and descriptive statistics was used or employed to any deviation of selected parameters , results was significantly associated between q SOFA in relation to number of ICU Days, and it was expressed statistically significant at ($P < 0.05$).

Table 1.5: shows association of SIRS with Need of Vasopressor

The need for Vasopressor	SIRS								Chi-square	
	1		2		3		4		P-value	Results
	F	%	F	%	F	%	F	%		
1	1	100%	16	72.7%	51	72.9%	31	54.4	0.119	Not Significant
2	0	0%	16	27.3%	19	27.1%	26	45.6		

The above Table 1.5 shows that, the association of 150 samples with their Need of Vasopressor, chi-square analysis was used to determine the significance of the association between SIRS results was showed to be insignificant at ($P > 0.05$).

Table 1.6: shows association of SIRS with Need of Mechanical Ventilator

Need for Mechanical of Ventilator	SIRS								Chi-square	
	1		2		3		4		P-value	Results
	F	%	F	%	F	%	F	%		
1	1	100%	16	72.7	56	80.0	35	61.4	0.122	Not Significant
2	0	0%	6	27.3	14	20.0	22	38.6		

The above Table 1.6 shows that, the association of 150 samples with their Need Of Mechanical Ventilator, chi-square analysis was used to determine the significance of the association between SIRS with support of Mechanical Ventilator , it was recorded as significant at ($P > 0.05$).

Table 1.7: shows association of SIRS with Number of ICU Days stay

No of ICU Days	SIRS								Chi-square	
	1		2		3		4		P-value	Results
	F	%	F	%	F	%	F	%		
1	0	0%	7	31.8%	18	25.7%	19	33.3%	0.486	not Significant
2	1	100%	9	40.9%	25	35.7%	14	24.6%		
3	0	0%	6	27.3%	27	38.6%	24	42.1%		

The above Table 1.7 shows that , the association of 150 samples of No of ICU Days regressed with SIRS criteria , the chi-square analysis was used to determine the significance of the association between SIRS and No of ICU Days, results showed to be insignificant at $P > 0.05$.

Figure 1.1: Kaplan Meir curve of qSOFA & SIRS

Fig 1.1 depicted that , qSOFA & SIRS shows significant difference was seen in the control of mortality rate , the cases were screened at early stage , which is more benefited to estimate the likelihood ration and hazard function of sepsis and sepsis shock patients . Both the variables of qSOFA & SIRS were shows better results for diagnosing the cases in association with many clinical attributes

Table 1.8: Area under curve of Increase in SOFA and SIRS

	AUC ROC	CI-95%	Sensitivity (%)	Specificity (%)
Increase in qSOFA Score $\geq$ 2	0.82	0.62-0.87	80.11	80
SIRS $\geq$ 2	0.68	0.52-0.691	91.25	23
qSOFA $\geq$ 2	0.71	0.68-0.74	64.88	40.44
Lactate $\geq$ 2 mmol/L	0.45	0.40-0.48	67.42	76.85

Table 1.8 shows , Binary logistic regression was applied for estimation of area under curve and accurate prediction of sepsis cases at early stage, the results found that Increase in qSOFA Score $\geq$ 2 was statistically significant AUC 0.82; CI 95% 0.62-0.87 ; specificity 80% and sensitivity was 80.11 %.

DISCUSSIONS

The study shown to be addressed the various predictors of qSOFA and SIRS criteria driven by the SOP .The outcomes Were seen mortality rate and ICU stay cases , it was regressed with structured score of the various components on both qSOFA and SIRS criteria. We have seen qSOFA shows significantly better than SIRS score for predicting unobservable components of disease. The ICU free days was representing factor to freeze the ventilator free days life supports , if any organ dysfunction free days were correlated structured score and it was statistically modelled with survival patrimonial

methods [2-3]. The study was found that, the increase level of SOFA score is ≥ 2 is covered better expression [AUC 0.82 ; CI 95% 0.52-0.96 ; sensitivity 80.11% and specificity 80.0% .In case of SIRS score ≥ 2 AUC was 0.68 CI 95% 0.68-0.74 ; sensitivity 91.25 with fewer value of specificity 40.44%]. Mean while lactate level was fall on reference range $p < 0.01$ [8-9]. Although , intervention could not be precluded that present study, not big enough to reveal marginal differences in such clinical outcomes , another plausible explanation is quoted on realistic approach , qSOFA is not shown a significantly accounted any signs of organ , renal and hepatic failure . In our results seem to be justify the concern qSOFA mortality, it may be less sensitive rather than SIRS criteria .For the sake of prediction , present predicting parameters shows clinical deterioration in patients at risk of sepsis considering with several clinical and serological attributes out of 150 samples with their Need of Vasopressor, SIRS Vasopressor ($P > 0.05$). The present research paper revealed that , the ICU days stay in hospital shows in significant , showed significance of the association between SIRS with their number of ICU Days and it was found to be insignificant at ($P > 0.05$). However , a systematic and practical approach concludes that, the SIRS criteria is significantly decline mortality rate with Hazard ratio 3.62 .Approach is inevitable as compared with qSOFA score And it was established and validated in prognostic tools for hospital death among patients with suspected infection of sepsis , while SIRS criteria is useful tool for treating sepsis

CONCLUSIONS

The study concludes that , the Department of Emergency with admitted and suspected cases , the SIRS as compared to qSOFA patients were positively correlated higher incidence of life support treatment and hospital stay. SIRS and qSOFA criteria is significantly more accurate for predicting an early established infection of sepsis.

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