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Original Research Paper

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EVALUATION OF SERUM VITAMIN D LEVELS IN SEPSIS, CORRELATION WITH QSOFA SCORE AND CLINICAL OUTCOME.

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ABSTRACT

Aims - To study Vitamin D levels in sepsis, correlation of qSOFA score for assessing the severity of sepsis and predicting outcomes in patients of sepsis.

Material And Methods - A cross sectional observational study was conducted at MLN Medical College, Prayagraj. A total of 140 patients were enrolled in the study after following inclusion and exclusion criteria's.

Result – In the study, it was found that, higher values of qSOFA scores were found in the non-survivors patients (34.7% vs. 2.9%). Also higher value was associated with longer hospital stay and multiorgan dysfunction and ICU admission. In this study, it was also seen that higher values of serum Vitamin D was seen in survivors (27.9 ± 9.7 ng/dL v/s 9.7 ± 4.7 ng/dL; P < 0.0001).Also lower values were associated with longer hospital stay and multiorgan dysfunction and ICU admission.

Conclusion – In this study, it was seen that higher values of qSOFA predicted poor clinical outcomes for patients with sepsis. Likewise, low S. Vitamin D levels were also associated with dismal clinical outcomes in sepsis.

KEYWORDS : Sepsis, Vitamin D, qSOFA.

INTRODUCTION

Sepsis is a leading cause of morbidity and mortality in critically ill patients worldwide. It is anticipated that it influences in excess of 30 million individuals worldwide consistently.

Sepsis involves magnitude of change in different physiological, haematological and biochemical parameters, thus these can be considered to be useful for prediction of outcome among sepsis patients admitted to an ICU. qSOFA is one such parameter, described as "**quick SOFA**" criteria for early detection of patients potentially at risk of dying from sepsis which comprise of 3 clinical indicators – Systolic blood pressure, respiratory rate and GCS for predicting the outcome in patients of sepsis. [1,2]

The nonclassical actions of vitamin D are cell specific and provide a number of potential new clinical applications for $1,25(OH)^2D3$. In 2009, Daniel Bikle et al[3] studied 'Nonclassic Actions of Vitamin D' and a connection between acute illness and Vitamin D was noted. Thus, evaluation of Vitamin D for its immunomodulatory role and its supplementation in sick ICU bound patients[4] and the affect it may have in influencing outcomes of such patients remains an area of active research.

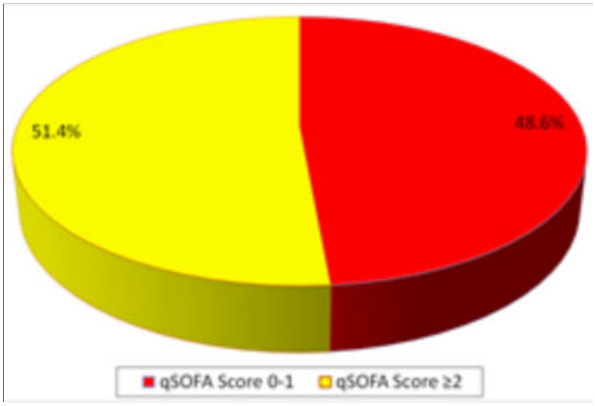
MATERIAL AND METHODS :

Study Design:

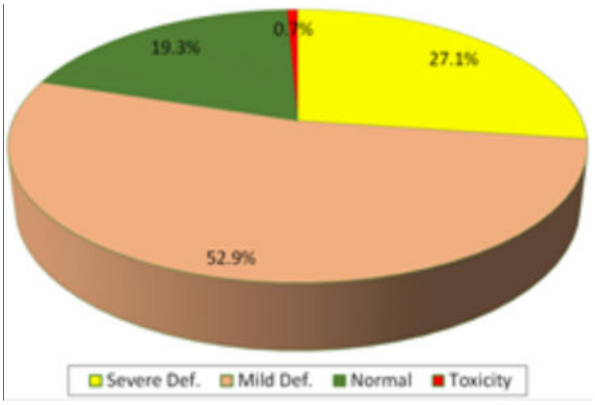
A cross sectional observational study was conducted at MLN Medical College, Prayagraj. A total of 140 patients were enrolled in the study. The patients who fulfilled the SOFA score criteria and gave consent for the study procedure were eventually included for the study. Patients with age less than 18 years, who were known case of Diabetes mellitus, Chronic Kidney Disease, Pregnant females, on steroid therapy and those unwilling for study related diagnostic procedures were excluded from the study.

RESULTS:

Of the total 140 patients - Breathlessness, cough with expectoration (42.9%) was the most common presenting symptom followed by focal neurological deficits and convulsions (11.4%). Mean age of patients enrolled in the study ranged between 18 and 86 years. Mean age of the patients was 48.29±17.01 years. Preponderance of male gender was observed in the study (54.3%). Gender ratio was 1.18.



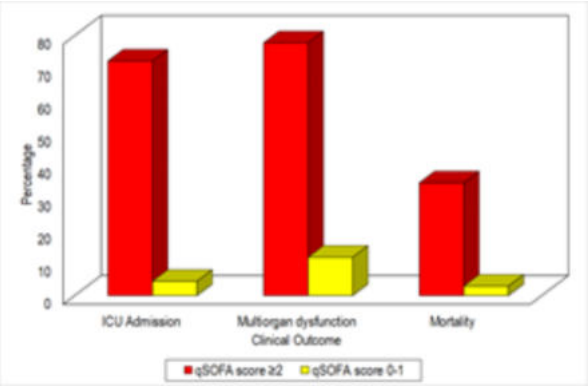
Distribution Of Study Population According To qSOFA Score



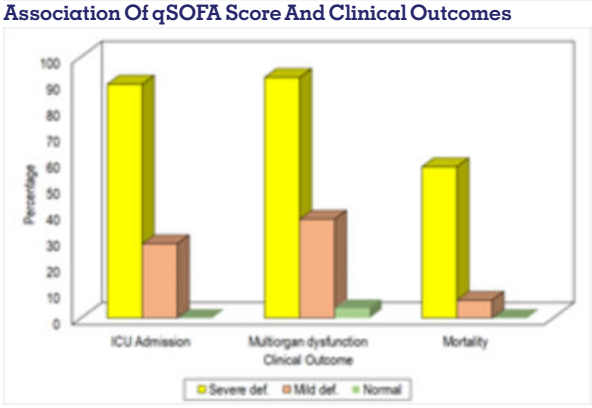
Distribution Of Study Population According To Vitamin D Levels

Clinical outcome in terms of need for ICU admission, presence of multiorgan dysfunction and mortality was assessed.

Association between individual parameters of qSOFA (GCS, Systolic blood pressure and Respiratory rate), qSOFA, Vitamin D and clinical outcomes was seen.



Association Of qSOFA Score And Clinical Outcomes



Association Of Vitamin D And Clinical Outcomes

Also, assessment of qSOFA in determining outcome in terms of sensitivity, specificity, Positive & Negative predictive value.

qSOFA And Outcomes

	Sensitivity	Specificity	PPV	NPV
ICU Admission	94.5	76.5	72.2	95.6
Multiorgan Dysfunction	87.5	78.9	77.8	88.2
Mortality	92.6	58.4	34.7	97.1

DISCUSSION:

In the present study, in an attempt to justify the usefulness of qSOFA score in predicting the outcome of patients (Duration of hospital stay, ICU admission, Multiorgan dysfunction and Mortality), we calculated association of qSOFA score with outcomes. It was found that – Mean duration of hospital stay (in days) was 4.78± 2.47 for patients with qSOFA score 0-1 and it was 11.46± 5.25 for patients with qSOFA score ≥2 which is statistically significant with a 'p' value of <0.001. Likewise, patients with qSOFA score ≥2 as compared to qSOFA score 0-1 had significantly higher requirement for ICU admission (72.2% vs. 4.4%) with a 'p' value of <0.001. Also, patients with qSOFA score ≥2 as compared to qSOFA score 0-1 had significantly higher Multiorgan dysfunction (77.8% vs. 11.8%) which is statistically significant with a 'p' value of <0.001. Lastly, patients with qSOFA score ≥2 as compared to qSOFA score 0-1 had higher Mortality (34.7% vs. 2.9%) which is statistically significant with a 'p' value of <0.001. Also, qSOFA predicts poor outcomes – ICU admission, Multiorgan dysfunction and mortality with sensitivity of 94.5%, 87.5% and 92.6% respectively.

To look for the usefulness of Vitamin D level in influencing the outcome of patients, we calculated association of Vitamin D levels with qSOFA score and duration of hospital stay, ICU admission, multiorgan dysfunction and mortality. It was found that – Mean vitamin D level was 20.00±13.52 ng/ml in 140 participants of study. 19.3% patients i.e., 27 had normal vitamin D levels, one-half (52.9%) had mild deficiency of vitamin D levels and approximately one-fourth (27.1%) patients had severe deficiency of vitamin D levels. Only 1 (0.7%) patient had possibility of vitamin D toxicity. Patients with normal vitamin D levels had minimum duration of hospital stay (3.59±1.37 days) which was followed by that of patients with mild deficiency (7.53±3.65 days) and maximum hospital stay among patients with severe Vitamin D levels (13.00±6.12 days). Patients with severe vitamin D deficiency as compared to mild deficiency and normal levels had significantly higher requirement of ICU admission (89.5% vs. 28.4% & 0.0%), incidence of multiorgan dysfunction (92.1%, 37.8% & 3.7%) and mortality (57.9% vs. 6.8% & 0.0%). Also, vitamin D levels of patients with qSOFA score 0-1 (29.57±12.50 ng/ml) was found to be significantly higher than those with qSOFA score ≥2 (10.96±6.30 ng/ml).

CONCLUSIONS

It is concluded from the study that qSOFA score at the time of admission is successful in predicting the prognosis of patients with sepsis. It was seen that higher values of qSOFA scores were found in the non-survivors. Also higher value was associated with longer hospital stay and multiorgan dysfunction and ICU admission.

Also it was seen that lower values of serum Vitamin D was seen in non-survivors. Also lower values were associated with longer hospital stay and multiorgan dysfunction and ICU admission.

Thus, the qSOFA can be routinely used as an initial clinical assessment so it may be a good prognostic marker of sepsis in developing country like India. Also Vitamin D supplementation may help in improving the clinical outcome for critically ill patients, however more elaborate studies are needed to confirm this.

Conflict Of Interest : None

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