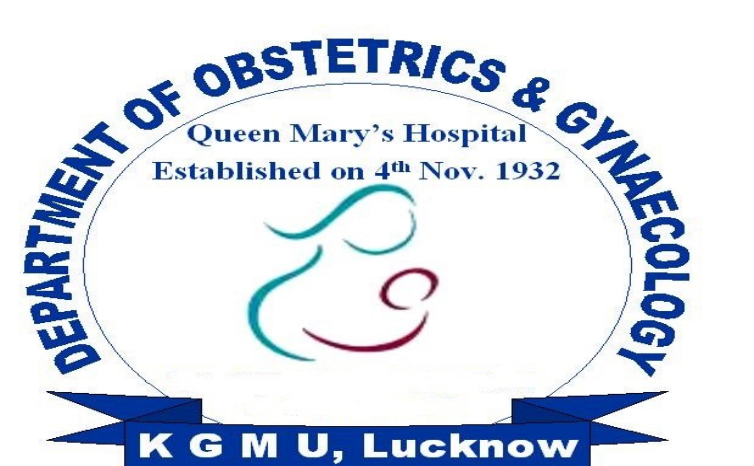




# Delta SOFA Score as a Prognostic Indicator in Women admitted to an Obstetric ICU of a Tertiary Health Centre in North India



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## Results

## Introduction

- Critically ill patients are characterized by a progressive and time-dependent organ dysfunction.
- Early identification of patients at risk of increasing organ damage could have an impact in terms of outcome improvement.
- Sequential Organ Failure Assessment (SOFA) score is useful for assessing morbidity & organ dysfunction or failure over time.
- Serial SOFA & Delta SOFA ( $\Delta$ -SOFA) scores allow tracking and better understanding of progression of disease and response to treatment.

## Objectives

**PRIMARY :** Assessment of Delta SOFA ( $\Delta$  SOFA) as a mortality predictor in patients admitted to an Obstetric ICU

**SECONDARY :** To correlate the number and severity of organ dysfunction with maternal mortality.

To determine the critical earliest time point and critical Delta SOFA which best predicts mortality.

Delta SOFA as a predictor of length of ICU stay and intervention (ventilator and vasopressor) free days

## Methodology

- ❖ Prospective observational cohort study
- ❖ Obstetric ICU , Department of OBGY , KGMU, Lucknow
- ❖ Duration : One year
- ❖ Institutional Ethics Committee approval & informed consent taken
- ❖ 125 consecutive ICU admissions fulfilling the inclusion criteria were enrolled

- ❖ SOFA score : Day 1( admission), Day 2, 3, 5, 7, 14, 21 & 28
- ❖ Follow up : Daily till discharge or mortality whichever was earlier.
- ❖ Treatment given , days of mechanical ventilation, vasoactive drugs & dialysis were recorded.
- ❖  $\Delta$  SOFA D1-3 &  $\Delta$ SOFA D1-5 were calculated.
- ❖ Group A –Survivors & Group B – Non Survivors
- ❖ Chi-square test , paired student t-test & ANOVA test were used for statistical analysis . p-value < 0.05 was regarded significant.

- ❑ To the best of our knowledge, this is the first study to evaluate the predictive performance of DELTA ( $\Delta$ ) SOFA scores in an Indian obstetric ICU
- ❑ Jain et al., 2016 observed maximum discriminatory power in neurological, cardiovascular & respiratory system.
- ❑ Our mortality rates were lesser in comparison to study by Jain et al., 33.33%. and higher than by Kallur et al., 2014 5.88%.
- ❑ Higher mortality rate , can be due to large number of referred cases with severe morbidity requiring critical care management.
- ❑ Garia-Gigorro et al., 2016 reported that with increase in  $\Delta$  SOFA score between 0-1 ( $\Delta$  SOFA=0-1), median days of mechanical ventilation was 3 (1-7) days and with a score  $\Delta$  SOFA $\geq$ 2, it was 6 (2-12) days.

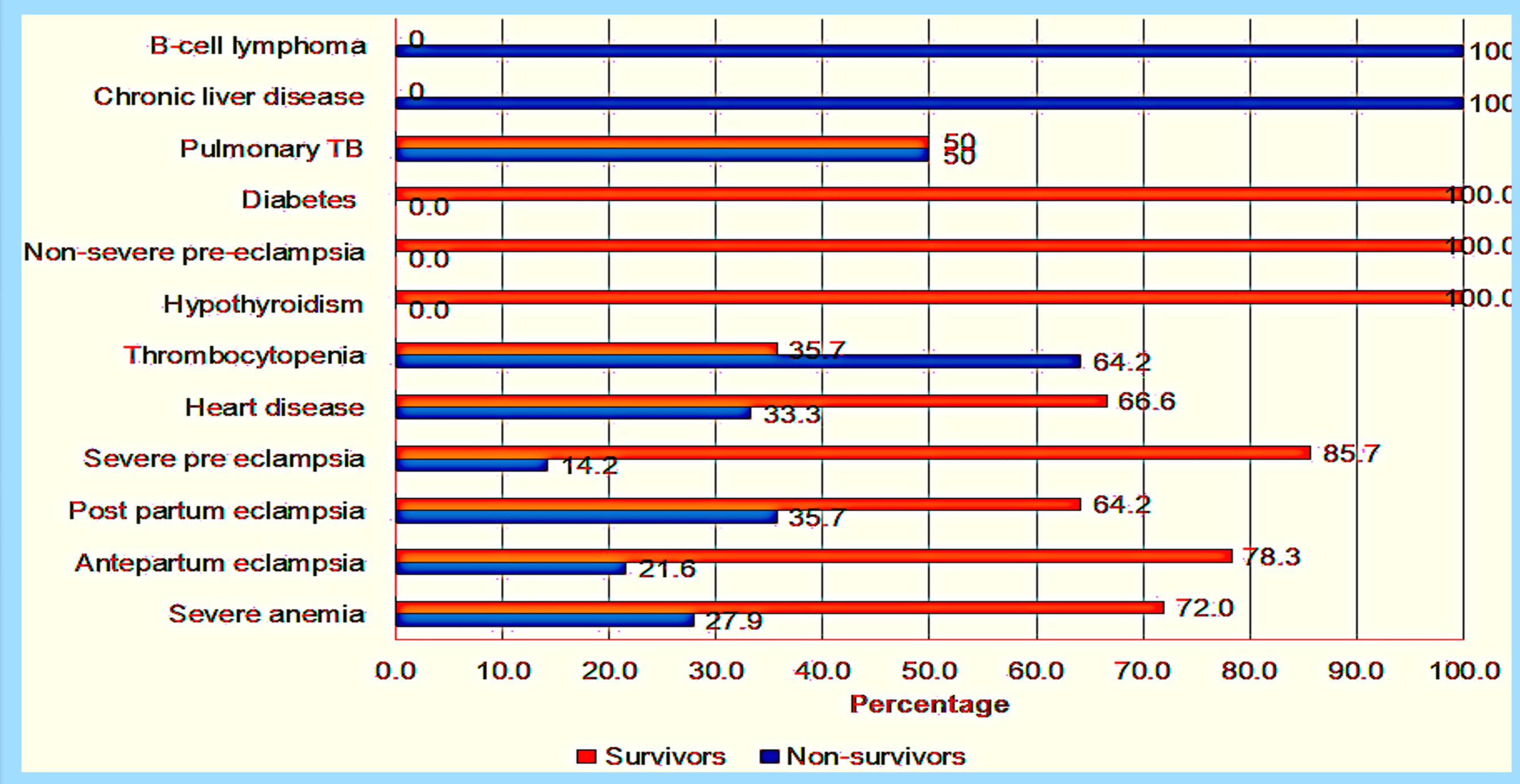
- ❖ There is a highly significant increase in maternal mortality and decrease in ventilator and vasopressor free days with the increment in the SOFA scores as compared to admission SOFA and daily maximum SOFA scores
- ❖  $\Delta$ SOFA D<sub>1-5</sub> cut off of >( +1.5) was found to be the best predictor of maternal mortality
- ❖ Mean total SOFA Score with a cut off of > 10.4, was found to be the second best predictor of maternal mortality
- ❖ Since cardiovascular, hepatic & respiratory systems have best discriminatory power in predicting mortality planning resource allocation for mechanical ventilation, cardiovascular monitoring, ionotropic drugs and potent antibiotics for these types of patients is important.

## CONCLUSION

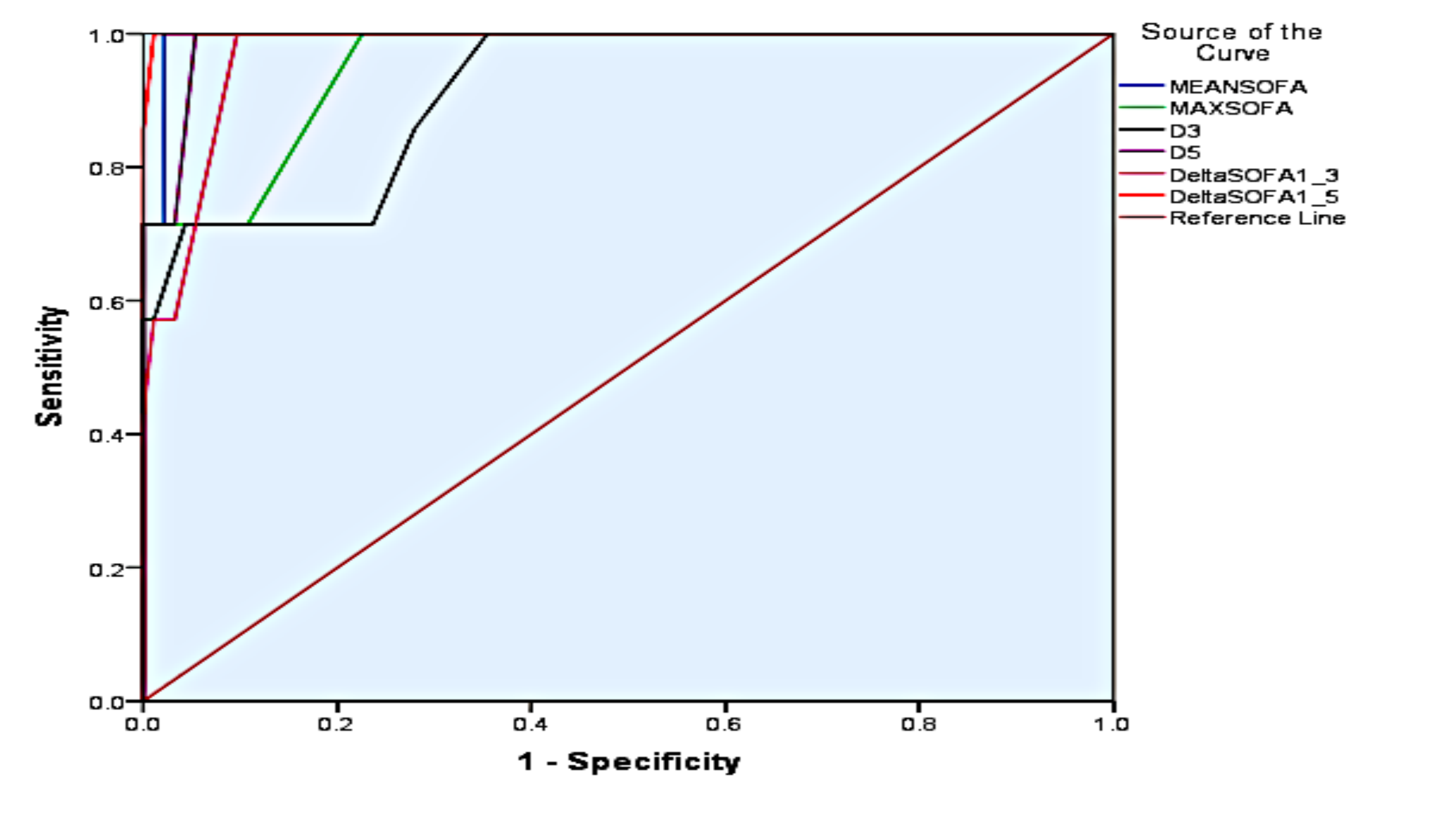
- ❑ Calculation of Delta SOFA ( $\Delta$  SOFA) score is relatively easy, by using variables that can be easily measured and provides an additional means of evaluating the effectiveness of treatment, should be used by all intensivists and obstetricians as a component of routine ICU care.
- ❑ At primary or secondary levels, if an individual organ SOFA score  $\geq$ 1 or total SOFA score  $\geq$ 3, prompt referral should be done without delay

## Take home message

- ❑ There were 63,324 admissions to Queen Mary's Hospital out of which 650 (1.02%) obstetric cases were admitted to ICU.
- ❑ 93 were survivors (74.4%) and 32 were non-survivors (25.6%)
- ❑ No significant difference in obstetric status between survivors and non-survivors
- ❑ Most common indications for ICU admission were hypertensive disorders, hemorrhagic conditions and sepsis
- ❑ Major etiology of maternal mortality was sepsis, followed by antepartum and postpartum eclampsia and hemorrhagic conditions (APH & PPH).



Most common co-morbid conditions : Severe anemia in 34.4% , antepartum eclampsia 29.6%, post-partum eclampsia , severe pre-eclampsia & thrombocytopenia in 11.2%



Comparison of Receiver Operator Characteristic (ROC) curves

**$\Delta$ SOFA D1-5** :cut-off of >( +1.5) : Maximum AUC (0.999; 95% CI 0.996-1.00, p< 0.001) 100 % sensitivity & 98.9 % specificity , 99.9% prediction of mortality.

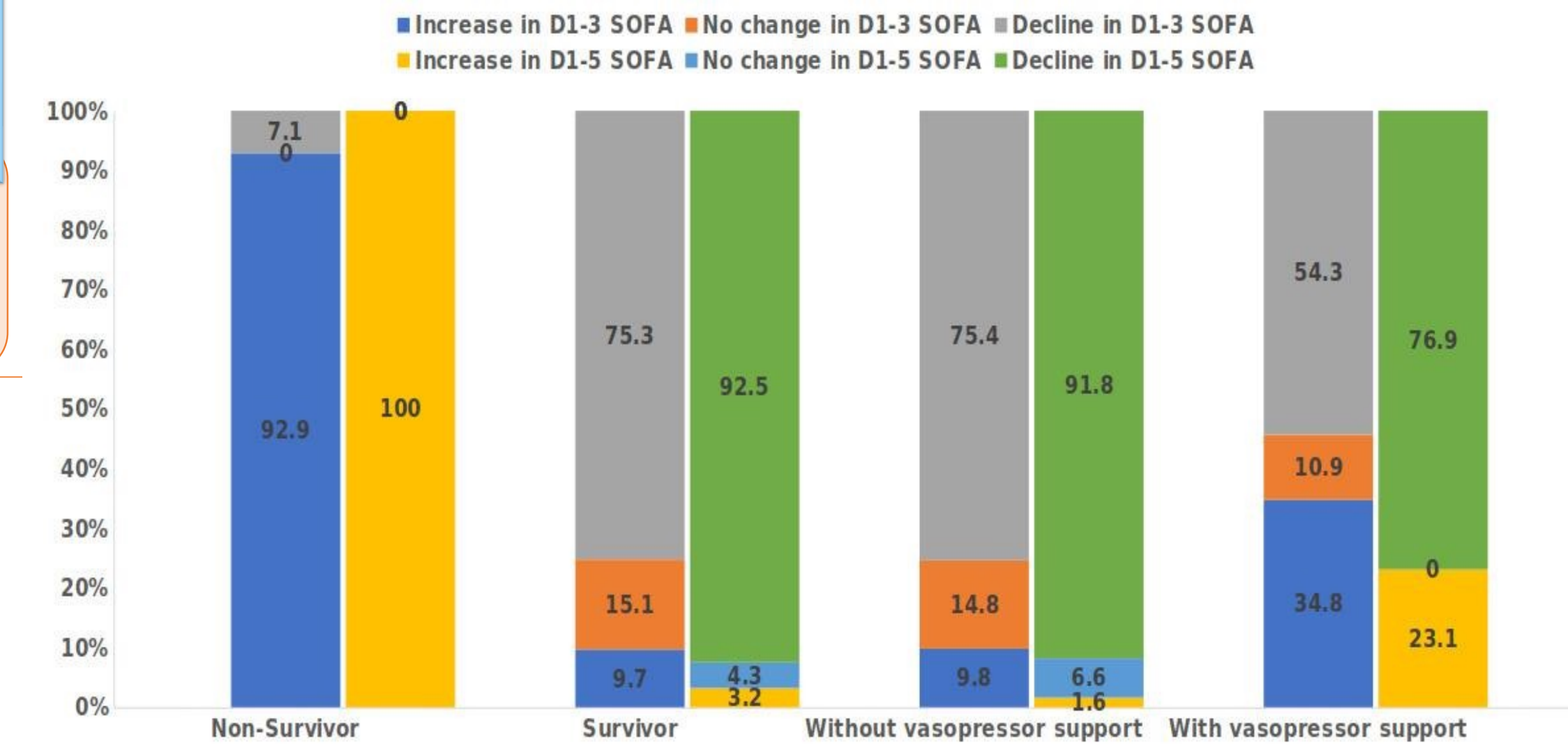
**Mean total SOFA Score** ,cut-off of > 10.4 :AUC 0.994 (95% CI 0.982- 1.000, ,p < 0.001,) 100% sensitivity & 97.8 % specificity , 99.4% prediction of mortality.

**Maximum SOFA Score** : cut-off of >12.50 has 100% sensitivity ,least specificity (77.4%), 95.2 % prediction of mortality (, 95% CI: 0.890-1.000).

**$\Delta$ SOFA D1-3** : 97.2% mortality prediction ,( 95% CI; 0.938-1.000, p < 0.001)

|                                | No of patients (n) | Min. change | Max. change | Increase in D1 SOFA |      | No change in D1 SOFA |      | Decline in D1 SOFA  |      |
|--------------------------------|--------------------|-------------|-------------|---------------------|------|----------------------|------|---------------------|------|
|                                |                    |             |             | No. of patients (n) | %    | No. of patients (n)  | %    | No. of patients (n) | %    |
| $\Delta$ SOFA D <sub>1-3</sub> | 107                | -13.00      | +7.00       | 22                  | 20.6 | 14                   | 13.1 | 71                  | 66.4 |
| $\Delta$ SOFA D <sub>1-5</sub> | 100                | -15.00      | +7.00       | 10                  | 10.0 | 4                    | 4.0  | 86                  | 86.0 |

Assessment of  $\Delta$ SOFA D1-3 &  $\Delta$ SOFA D1-5



- ❖ 92.9 % nonsurvivors on D 3 and 100% non-survivors on D 5 showed increment in  $\Delta$ SOFA D1-3 &  $\Delta$ SOFA D1-5 scores
- ❖ Median length of mechanical ventilation of 7.5 (2-24) days & vasopressor support of 6 (0-24) days for patients with increase in  $\Delta$ SOFA D1-5 was maximum & highly significant (p<0.001)
- ❖ Median length of ICU Stay of patients was significantly higher with increase or no change in  $\Delta$ SOFA D1-5, of 10.50 & 11 days

| Variable      | Area under curve | 'p'    | 95% CI      |             |
|---------------|------------------|--------|-------------|-------------|
|               |                  |        | Lower bound | Upper bound |
| Respiratory   | 0.804            | <0.001 | 0.721       | 0.887       |
| Hematological | 0.763            | <0.001 | 0.662       | 0.863       |
| Hepatic       | 0.808            | <0.001 | 0.716       | 0.901       |
| CVS           | 0.875            | <0.001 | 0.811       | 0.940       |
| CNS           | 0.500            | 1.000  | 0.384       | 0.616       |
| Renal         | 0.757            | <0.001 | 0.667       | 0.846       |

- ❖ Cardiovascular system had the best discriminatory power followed by hepatic system, respiratory system, hematological system and renal system.
- ❖ Neurological system had the least discriminatory power.