

INTENSIVE CARE UNIT SCORING SYSTEMS AND OUTCOME OF CKD PATIENTS ADMITTED IN ICU

Goswami J, Balwani M, Godhani U, Patel M
Department of Nephrology and Transplant Sciences
Manipal Hospital Jaipur, India.



Introduction

- Worldwide there is rise in Chronic Kidney Disease (CKD) patients and consequently end-stage renal disease (ESRD) during the last decade due to an increased prevalence of hypertension, type 2 diabetes mellitus, and an ageing population [1]
- It is estimated that ESRD patients comprises of 10% of the renal replacement therapy population in the ICU [2]
- ICU provides care to these high-risk patients and demand commitment, attention, and qualified skills from clinicians. However, an excessive ICU workload may interfere with the quality of the care provided.
- Therefore, various scoring systems are designed as predictive modalities which are used in ICU that assess disease severity on admission based on the degree of derangement of routinely measured physiological variables [e.g. Acute Physiology and Chronic Health Evaluation (APACHE), Simplified Acute Physiology Score (SAPS)] and scores that assess the presence and severity of organ dysfunction [e.g. Sequential Organ Failure Assessment (SOFA)] are commonly used tool to predict outcome in ICUs. These illness severity scores have not been specifically evaluated to predict outcome in CKD patients.
- It is seen that the ESRD patients admitted to ICUs had considerably higher mortality and morbidity.[3-5]. However, some recent studies had contradict this finding[6]. Therefore, the validity of these scoring systems needs to be assessed and confirmed in ESRD patients

Aim

- This study assessed the outcome of CKD patients admitted to ICU and evaluated prediction of 30-day mortality using Acute Physiology and Chronic Health Evaluation (APACHE II), Simplified Acute Physiology Score (SAPS II) and Sequential Organ Failure Assessment (SOFA) score

Methods

- 100 consecutive CKD patients admitted to an ICU at a tertiary care hospital, Ahmadabad between 2011- 2013 were included prospectively.
- Data on demographics, indication for admission, cause of CKD, use of vasoactive drugs & mechanical ventilation (MV), mode of renal replacement therapy (RRT) and 30-days mortality were recorded.
- The APACHE II, SAPS II and SOFA scores were calculated based on admission characteristics.

Results

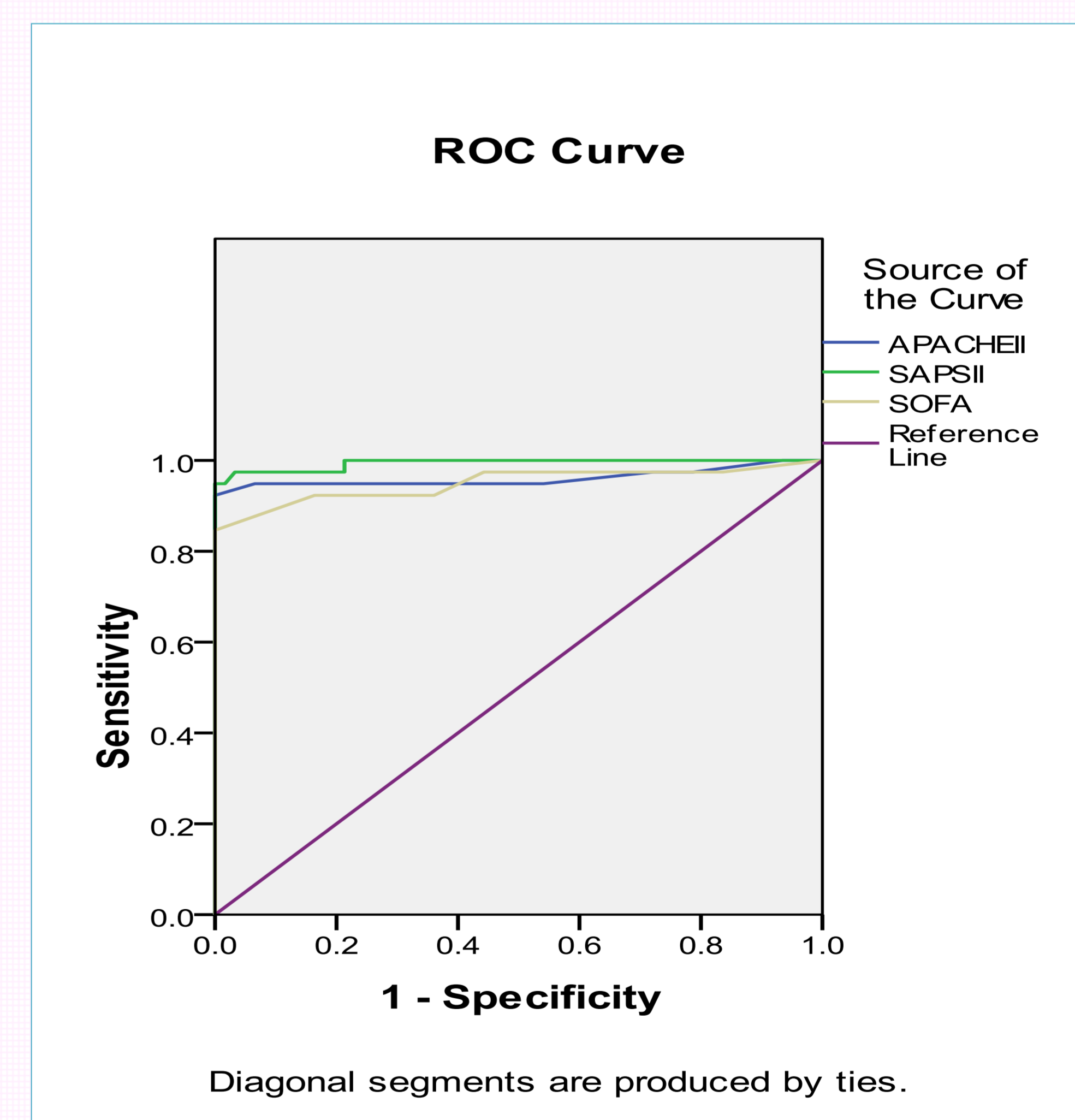
- The mean APACHE II, SAPS II and SOFA scores were 28.22±7.53, 43.04±16.40 and 10.39±5.20 respectively, and area under receiver operating characteristics curve(AUROC) in predicting 30-day mortality were 0.961, 0.994 and 0.950, respectively.
- The scores were significantly higher in 30-days non survivors as compared to survivors (**p= 0.001**).
- The ICU mortality and 30-day mortality rates were higher (34% and 39% respectively).
- During the ICU stay, mechanical ventilation (MV) and vasoactive drugs were required in 57% and 67% patients, respectively, and the requirement were significantly greater in non survivors as compared to survivors (**p= 0.001**).
- In addition to the scores, need for MV and vasoactive drugs were significant predictors of mortality. 85% patients were on intermittent haemodialysis and 15% were on continuous veno-venous hemodiafiltration.
- Sepsis was the main reason for hospital admission and mean ICU length of stay was 7.74 ± 5.34 days.

Baseline characteristic	
Age (yrs)	49.04±14.30
Gender, Male (%)	79 (79%)
Diagnosis	
Diabetic nephropathy	30 (30 %)
Chronic glomerulonephritis	20 (20 %)
Autosomal dominant polycystic kidney disease	6(6 %)
Chronic interstitial nephritis	10(10 %)
Chronic allograft injury	4(4 %)
Hypertensive nephropathy	10(10 %)
Sec. Amyloidosis	5(5 %)
CKD of unknown origin	15(15 %)
Cause of admission	
Cardiac arrest	7 (7 %)
CVA	16(16 %)
GI bleeding	6(6 %)
IHD	16(16 %)
Peritonitis	4(4 %)
Pul. Edema	11(11 %)
Sepsis	40 (40 %)
Other evaluated parameters	
RRT type: IHD/ CVVHDF	85(85 %)/15(15 %)
Need for MV	57(57 %)
Need for vasoactive drugs	67(67 %)
ICU mortality	34(34 %)
30 day mortality	
Mean APACHE II score	28.22±7.53
Mean SAPS II score	43.04±16.40
Mean SOFA II score	10.39±5.20
Length of hospital stay (days)	7.74±5.34

Table 1: Baseline characteristics of patients

Parameters	30 day mortality		P value
	Yes (non-survivors) (n = 39)	No (survivors) (n = 61)	
Age (years)	39.92±12.09	38.47±15.62	0.624
APACHE II	35.79± 6.16	23.37± 2.87	0.001
SAPS II	60.82 ±8.13	31.67±8.04	0.001
SOFA	15.56±4.28	7.08±2.13	0.001
MV	32 (56.1%)	25(43.9%)	0.001
Vasoactive drugs	37 (55.2%)	30(44.8%)	0.001
IHD	25(29.4%)	60(70.6%)	0.001
CVVHDF	14(93.3%)	1(6.7%)	

Table 2: Comparison of 30-day survivors and non-survivors



Graph 1: Comparison between the Area under the receiver operating characteristic curves of APACHE II score, SAPS II and SOFA score in discriminating 30-day survivors from non-survivors

Conclusion

- The outcome of CKD patients admitted to ICU is poor. All three scores (APACHE II, SAPS II and SOFA) perform equally well and has equal diagnostic utility in predicting 30-days mortality.
- Large, multi-center study is required to corroborate the study findings.

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