

**A COMPARATIVE STUDY OF C-REACTIVE PROTEIN VS INITIAL LACTATE VS
LACTATE CLEARANCE IN CKD IN EMERGENCY DEPARTMENT**



PROJECT SUBMITTED TO

SAVEETHA COLLEGE OF ALLIED HEALTH SCIENCES (SCAHS)

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FOR THE AWARD OF THE DEGREE OF**

**BACHELOR OF SCIENCE HONS
(ALLIED HEALTH SCIENCE)**

TRAUMA CARE MANAGEMENT

**BY
D.ANUPRIYA**

2021-2025

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

DECLARATION

I declare that the project entitled “**A COMPARATIVE STUDY OF C-REACTIVE PROTEIN VS INITIAL LACTATE VS LACTATE CLEARANCE IN CKD IN EMERGENCY DEPARTMENT**” submitted by me for the award of degree **Bachelor of Science Hons – Allied Health Science** (TRAUMA CARE MANAGEMENT) is the record of original research work carried out by me during the period under the guidance of **DR.D.VINDHYA** and has not formed the basis for the award of any degree, diploma, associateship, fellowship, titles in this or any other university.

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Place:

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

CERTIFICATE

This is to certify that this study titled “**A COMPARATIVE STUDY OF C-REACTIVE PROTEIN VS INITIAL LACTATE VS LACTATE CLEARANCE IN CKD IN EMERGENCY DEPARTMENT**” is a bonafide and genuine research work carried out by **D. ANU PRIYA (242101011)** in the Department of Trauma Care Management under our guidance during academic year (2021- 2025) and is being submitted in partial fulfillment of the Degree of **Bachelor of Science Hons Allied Health Science (Trauma Care Management)**.

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BONAFIDE CERTIFICATE

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D. ANU PRIYA

ABBREVIATIONS

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

LIST OF ABBREVIATIONS

S.No	ABBREVIATION	FULL FORM
1	CAD	CORONARY ARTERY DISEASE
2	CKD	CHRONIC KIDNEY DISEASE
3	CRP	C- REACTIVE PROTEIN
4	ESRD	END STAGE RENAL DISEASE
5	HS-CRP	HIGH SENSITIVITY C-REACTIVE PROTEIN
9	T2DM	TYPE 2 DIABETES MELLITUS
10	HTN	HYPERTENSION
11	PIC	PERCUTANEOUS CORONARY INTERVENTION

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A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
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TITLE

**A COMPARATIVE STUDY OF C-REACTION PROTEIN VS INITIAL
LACTATE VS LACTATE CLEARANCE IN CKD IN EMERGENCY
DEPARTMENT**

INTRODUCTION

Chronic kidney disease is a progressive and irreversible loss of renal function that leads to a cascade of metabolic, cardiovascular and systemic derangements. The presence of CKD complicates due to the altered physiological milieu, impaired toxin clearance, and increased susceptibility to infection and cardiovascular instability.

In the context of acute presentations such as breathlessness, and chest pain or systemic inflammatory response, it becomes imperative to have reliable biomarkers for early risk stratification, treatment monitoring, and prognostication.

Lactate is a marker for anaerobic metabolism, produced by cells during tissue hypoxia. In acutely ill patients, elevated lactate >2 mmol/L is associated with poor outcomes and correlates with the severity of hypoperfusion, particularly in sepsis and shock.

Lactate clearance, calculated as the percentage reduction in lactate levels over time, especially within the first 6 hours, is increasingly recognized as a resuscitation endpoint and prognostic marker. In CKD patients, where baseline lactate may be mildly elevated, the clearance over time provides a more reliable indicator of treatment response than the absolute initial value

MECHANISMS

Dialysis related factors: dialysis, particularly haemodialysis, can stimulate cytokine release via complement activation and endotoxin exposure.

IMPLICATIONS

Elevated CRP is associated with poor outcomes, including cardiovascular events, malnutrition inflammation, atherosclerosis syndrome and mortality. It is also a sensitive, though non-specific marker of acute infection in CKD patients, especially when baseline levels are already elevated.

ELEVATED LACTATE: IMPAIRED METABOLISM AND HYPOPERFUSION

In CKD, lactate levels may rise due to both increased production and reduced clearance, with or without tissue hypoxia.

MECHANISMS

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

- **Reduced renal clearance:** The kidneys contribute significantly to lactate clearance (30%) reduced GFR leads to impaired gluconeogenic function and lactate accumulation.
- **Tissue Hypoxia:** Anemia, cardiac dysfunction and microvascular disease in CKD patients reduce oxygen delivery at the tissue level, promoting anaerobic glycolysis.
- **Sepsis and Shock States:** CKD patients are predisposed to infection and sepsis, which induce elevated lactate via impaired oxygen utilization and altered microcirculation

The various biomarkers used in the emergency department, C-Reactive protein and Arterial blood gas stand out for their clinical utility in detecting inflammation and tissue hypoperfusion, respectively. This research focuses on comparing CRP, INITIAL LACTATE, and 6TH HOUR LACTATE CLEARANCE in CKD patients presenting to the EMERGENCY DEPARTMENT, examining their relative roles in identifying severity, predicting outcomes and guiding early resuscitative efforts.

INTERPLAY BETWEEN CRP AND LACTATE IN CKD

In the emergency department or ICU, elevated CRP and lactate often coexist in critically ill CKD patients. Their combination often signifies systemic inflammatory response with impaired perfusion as in:

- Urosepsis in ESRD
- Dialysis catheter infections
- Cardiorenal syndrome with tissue hypoxia
- Septic shock in peritoneal dialysis
- Elevated c- reactive protein: a chronic inflammatory state

WHY IT IS IMPORTANT TO INVESTIGATE THIS ISSUE

1. INCREASED VULNERABILITY IN CKD PATIENTS

CKD patients have altered immune responses and metabolic profiles, making them more prone to sepsis, shock and poor outcomes.

Biomarkers like CRP and lactate may vary differently in these patients due to reduced renal clearance and chronic inflammation.

2. NEED FOR RAPID RISK STRATIFICATION IN THE ED

Emergency physicians need quick, reliable tools to predict which CKD patients are at high risk of mortality or ICU admission.

3. POTENTIAL PROGNOSTIC VALUE OF CRP AND LACTATE

CRP is a well-known marker of inflammation and lactate is a marker of tissue hypoperfusion.

Lactate clearance over time (e, g., 6 hours) has been shown in this research to predict clinical outcomes

This research is necessary because CKD patients are at a high risk of complications in emergency department commonly used biomarkers like CRP and lactate, may behave differently due to impaired kidney function. Studying these markers can improve early risk assessment, guide timely intervention and ultimately improve outcomes

C-REACTIVE PROTEIN

Acute phase reactant produced by the liver in response to inflammation, infection and tissue injury. In patients with CKD, particularly those in stages 3-5, baseline CRP levels are elevated due to a chronic inflammatory state associated with uremia, endothelial dysfunction, and comorbid conditions such as atherosclerosis. Despite this limitation, CRP remains a valuable marker for identifying superimposed infections or acute exacerbations. Elevated CRP levels may support the presence of an underlying septic or inflammatory process, although it lacks specificity for hypoperfusion.

INITIAL LACTATE

In CKD patients, lactate clearance is partially impaired due to decreased renal excretion. Initial lactate measurement on presentation provides rapid and dynamic insight into the patients' hemodynamic status and risk of mortality.

6TH HOUR LACTATE CLEARANCE

A lactate clearance of >10% at 6 hours is generally associated with improved outcomes and is often used to evaluate the efficacy of fluid resuscitation, vasopressor therapy, and infection

control measures. In contrast poor or absent lactate clearance suggests persistent tissue hypoxia, ongoing inflammation or impending organ failure, prompting escalation of care.

REVIEW OF LITERATURE

1. INFLAMMATORY MARKERS AND PROGNOSIS IN CKD PATIENTS

C-Reactive protein is a widely used inflammatory biomarker associated with systemic inflammation, infection and sepsis. In chronic kidney disease, baseline CRP levels are often elevated due to proinflammatory state, complicating its interpretation in acute scenarios like sepsis or acute illness in the Emergency department

Zimmermann et al. (1999) reported elevated baseline CRP in CKD patients, independent of acute infections.

Stenvinkel et al. (2002) described inflammation as a key component of CKD progression and morbidity, reducing the specificity of CRP as a prognostic marker in this population.

2. LACTATE AS A MARKER OF TISSUE HYPOPERFUSION:

Lactate is a marker of anaerobic metabolism and tissue hypoperfusion, commonly used in sepsis and critical illness to guide resuscitation efforts

In CKD patients the metabolism of lactate is generally preserved unless there is hepatic dysfunction but acid base disturbances in CKD may complicate lactate interpretation.

3. LACTATE CLEARANCE AS A DYNAMIC PROGNOSTIC MARKER

Lactate clearance, particularly at 6 hour is increasingly recognized as a dynamic marker of resuscitation efficacy and prognosis.

Nguyen et al. (2004) found that early lactate clearance is associated with decreased mortality in septic shock patients.

Arnold et al. (2009) emphasized that lactate clearance >10% within the first 6 hours correlated with improved outcomes in critically ill patients.

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Andersen et al. (2013) noted that lactate metabolism is affected in CKD due to reduced renal gluconeogenesis and potential mitochondrial dysfunction.

Hsu et al. (2017) discussed the effect of renal dysfunction on lactate kinetics, noting higher baseline lactate levels and delayed clearance in patients with CKD.

4. USE OF LACTATE AND LACTATE CLEARANCE IN THE EMERGENCY DEPARTMENT

In Emergency department, lactate is used as a rapid indicator of severity. Lactate clearance has emerged as a superior marker compared to static lactate values for risk stratification and prognosis

Mikkelsen et al. (2009) showed that lactate clearance is a better predictor of mortality than initial lactate in ED patients with sepsis.

Bakker et al. (2016) recommended serial lactate measurement as part of goal-directed therapy in shock management.

5. CURRENT GAPS AND FUTURE DIRECTIONS

There is large scale, prospective studies specifically evaluating lactate clearance in CKD patients in the Emergency Department

Research is needed to in this subgroup define appropriate cutoff values and timelines of lactate clearance in this subgroup

Integration of lactate clearance with other biomarkers (e.g.,) CRP improve prognostic accuracy.

AIM AND OBJECTIVES

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

AIM

This study aims to compare CRP, initial lactate, and 6-hour lactate clearance in CKD patients to determine their relative predictive value in assessing disease severity and outcomes.

OBJECTIVES

To compare the prognostic value of C-reactive protein (CRP), baseline lactate levels, and 6-hour lactate clearance in patients with chronic kidney disease (CKD).

To evaluate the correlation between CRP levels and patient outcomes such as morbidity and mortality in CKD.

To determine if 6-hour lactate clearance provides a better prognostic indicator than static lactate measurements or CRP in CKD patients

PRINCIPAL RESEARCH QUESTIONS FRAMING THE STUDY

Does 6-hour lactate clearance provide a better prognostic indicator than CRP or initial lactate levels in CKD patients?

Among CRP, initial lactate, and 6-hour lactate clearance, which biomarker shows the strongest association with poor clinical outcomes in CKD?

Can lactate clearance be used as a dynamic marker for predicting the need for ICU care, renal replacement therapy, or in-hospital mortality in CKD patients

HYPOTHESIS

Null Hypothesis (H_0):

There is no significant difference in the prognostic value of C-Reactive Protein (CRP), initial lactate, and 6-hour lactate clearance in predicting clinical outcomes in chronic kidney disease (CKD) patients in the emergency department.

Alternative Hypothesis (H_1):

There is a significant difference in the prognostic value of CRP, initial lactate, and 6-hour lactate clearance in predicting clinical outcomes in CKD patients in the emergency department, with 6-hour lactate clearance being the most reliable prognostic marker.

METHODOLOGY

STUDY SETTING

The prospective observational study was conducted in the Emergency Department of Saveetha Medical College and Hospital over a duration of one year (2024-2025). It included 106 adult CKD patients (Stages 3–5) with suspected infection or sepsis. The study was both retrospective and prospective in design.

PROS:

- Real-time data and observation-based inputs included.
- Critically ill population ensured relevance to emergency clinical care.
- High translational value in emergency medicine practice.

CONS:

- Single-center study limited to the emergency setting
- Possibility of variation in intubation drug protocols
- Potential for missing or incomplete data during high-acuity events

ETHICAL APPROVAL NUMBER:

The study was approved by the Institutional Ethics Committee (IEC No: 005/06/2025/IEC/SMCH), Saveetha Medical College and Hospital.

STUDY DESIGN

Both retrospective and prospective study conducted in the emergency department of a tertiary care hospital

SAMPLING SIZE

A total of 104 chronic kidney patients in the emergency department were included in the study

DURATION:

- 2024-2025

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Sample form and summary:

All patients who met inclusion criteria were enrolled using convenience sampling. Chronic kidney patients who were admitted due to a variety of life threatening conditions including breathlessness, septic shock, pulmonary edema. The following predictors were assessed

- Age more than 18 years
- Diagnosis of chronic kidney patients
- Admitted with suspected infection, sepsis and acute deterioration
- Initial and 6th hour lactate value
- c-Reactive protein

Case Sheet Verification and Bias Minimization:

All case sheets were reviewed against emergency records and EMRs by the primary investigator and faculty supervisor. Discrepancies (e.g., mismatched times, missing vitals) were resolved by referring to treating physicians or source documents. A standardized proforma was used for all entries. Efforts to minimize sampling bias included the use of strict inclusion/exclusion criteria and complete enumeration of eligible patients during the study period.

INTERNAL VALIDITY

- Adults aged ≥ 18 years
- Diagnosed with Stage 3–5 CKD
- Admitted with suspected infection, sepsis, or acute deterioration

EXTERNAL VALIDITY:

- Patients who died or were discharged before 6-hour lactate sample
- Patients who decline hospital admission or choose to self-discharge against medical advice.

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DATA COLLECTION:

PROFORMA:

Structured proforma included the following parameters:

- Demographic details (age, gender)
- Clinical diagnosis and comorbidities
- Chief complaints
- C-reactive protein value
- Initial lactate
- 6th hour lactate value
- Lactate clearance
- Urea
- Creatinine
- Outcome

DATA VERIFICATION:

All data entries were verified by D. ANU PRIYA,, Final Year B.Sc Trauma Care Management Intern under the supervision of Mr. Manikandan, Faculty of Allied Health Sciences. In case of ambiguity, the treating physician was consulted. Conflicting entries were resolved through source verification

DATA SOFTWARE:

All cleaned and verified data were imported into IBM SPSS Statistics Version 25.0. Variables were labeled appropriately, and system-missing codes were used for excluded values

STATISTICAL ANALYSIS

STATISTICAL PROCEDURES:

Descriptive statistics were used to summarize baseline variables such as age, gender, vital signs, and comorbidities. Associations between predictors and PIH were analyzed using Chi-square and Mann-Whitney U analysis test for categorical variables. Logistic regression was used to determine significant predictors of chronic kidney patients

Software Used:

Statistical analysis was performed using IBM SPSS Version 25.0 (IBM Corp., Armonk, NY, USA).

INDEPENDENT VARIABLES:

- AGE
- GENDER
- VITALS
- C- REACTIVE PROTEIN VALUE
- INITIAL LACTATE
- 6TH HOUR LACTATE
- LACTATE CLEARANCE
- UREA
- CREATININE
- OUTCOME

REVIEW OF LITERATURE

REVIEW OF LITERATURE

Review 1

ROLE OF C-REACTIVE PROTEIN IN KIDNEY DISEASES

Li, Jiaxiao, et al. "Role of C-Reactive Protein in Kidney Diseases." Kidney and Blood Pressure Research, vol. 47, no. 12, 2022, pp. 737–750. S. Karger AG

C- Reactive protein is a pentameric protein consisting of five identical subunits, is the prototypical acute phase protein in response to infection and inflammation. In acute infection or inflammation, C- Reactive protein can be secreted at the beginning of 4-10 hours following inflammatory stimulation, peaking at 48 hours with a short half-life of 19 hours. Whereas, continuing high levels of C-Reactive protein may induce chronic inflammation, as reported in patients with chronic kidney disease or end stage renal disease. Therefore, elevated C-Reactive protein level is considered a biomarker for inflammatory response, tissue injury and chronic progression of diseases. C-Reactive protein is often compared with other biomarkers such as procalcitonin and lactate in sepsis or acute illness. While lactate reflects tissue hypoxia and metabolic stress, C-Reactive protein provides a broader view of inflammatory status. Chronic kidney disease is characterized as progressive loss of renal function. Inflammation and fibrosis are common pathological features that contribute to the progression of chronic kidney disease. It has been well established that C- Reactive protein is a risk factor of chronic kidney disease, elevated serum levels of c-reactive protein are also associated with mortality and morbidity of chronic kidney disease. In chronic kidney disease patients, a high c- reactive protein level is found to be a predictor of cardiovascular events and an independent risk factor for all cause mortality in stage 3 and 4 chronic kidney disease patients. It is highly possible that high c-reactive protein may promote the infiltration of inflammatory cells and release of cytokines, chemokines and TGF-BETA. Hence the interplay between inflammation and fibrosis is a major determinant in the progression of chronic kidney disease in response to c-reactive protein.

Review 2

THE CUMULATIVE EXPOSURE TO HIGH SENSITIVITY C-REACTIVE PROTEIN PREDICTS THE RISK OF CHRONIC KIDNEY DISEASE

Gao, Jingli, et al. "The Cumulative Exposure to High Sensitivity C-Reactive Protein Predicts the Risk of Chronic Kidney Disease." Kidney and Blood Pressure Research, vol. 44, no. 6, 2019, pp. 749–757. S. Karger AG

This study was to characterize the association of cumulative exposure to increased high sensitivity c- reactive protein with chronic kidney diseases. The kailuan study is a cohort study on risk factors for cardiovascular on risk factory of cardiovascular disease based on community population. We included 35,194 participants with Hs-CRP measured at three examinations in 2006, 2008, 2010. Participants were classified into non exposed group (Hs-CRP <3.0mg/L in all 3 examinations, 1 exposed group (Hs-CRP \geq 3.0 mg/L in 1 of the 3 examinations), 2-exposed group (Hs-CRP \geq 3.0 mg/L in 2 of the 3 examinations) and 3-exposed group (Hs-CRP \geq 3.0 mg/L in 3 examinations). Cox proportional hazards models were used to assess the association of cumulative Hs-CRP with incident CKD. CKD includes an estimated glomerular filtration rate (eGFR) <60mL/min/1.73 or urinary protein positive. The study showed the risk of CKD as the number of years of exposure to s-CRP increases. Participants in 3-exposed group had significantly increased CKD risk with hazard ratio (HR) (95% confidence interval, CI) of 1.70 (1.49–1.93), in comparison with 1.47 (1.34–1.62) for participants in the 2-exposed group, and 1.08 (1.00–1.16) for those in the 1-exposed group ($p < 0.01$); mean-while, the similar and significant associations were also observed for eGFR <60 mL/min/1.73

Review 3

ROLE OF HIGH SENSITIVITY C-REACTIVE PROTEIN AS A MARKER OF INFLAMMATION AND ITS PROGNOSTIC SIGNIFICANCE IN CHRONIC KIDNEY DISEASE PATIENTS

Khunte, Sanjeev Kumar, Jitendra Kumar, and Prakash Khunte. "Role of High Sensitivity C-Reactive Protein as a Marker of Inflammation and Its Prognostic Significance in Chronic Kidney Disease Patients." International Journal of Advances in Medicine, vol. 6, no. 2, 2019, pp. 335–340.

This cross-sectional observation study was conducted in Rajendra institute of medical sciences, Ranchi during study period October 2015 to September 2017 on admitted patients with chronic kidney disease. 90 patients of different age groups between 16-75 years were enrolled in the study. Samples were selected by using a simple random sampling method. 85.6% of the patients studied were males and 14.4% of the patients were females. Most cases of CKD were associated with hypertension (77.8%) out of which there were 62 males and 8 females, followed by DM (25.5%) where there were 20 males and 3 females. 44.4% cases had an elevated level of Hs-CRP patients, 35 were male and 5 were female. Patients with elevated creatinine levels had significantly high Hs-CRP levels

Review 4

ASSOCIATION BETWEEN HIGH SENSITIVITY C-REACTIVE PROTEIN AND DIABETIC CHRONIC KIDNEY DISEASE IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

Tang, Min, et al. "Association Between High Sensitivity C-Reactive Protein and Diabetic Chronic Kidney Disease in Patients With Type 2 Diabetes Mellitus." Frontiers in Endocrinology, vol. 13, 2022, article 885516.

This study aimed to identify the correlation between Hs-CRP levels and diabetic kidney disease in patients with T2DM. This cross sectional and observational study included n=927 patients with T2DM. Collected the data of patients based on their medical data, including sociodemographic characteristics, laboratory data results and medical therapy. Diabetes mellitus has become a major and serious threat to global human health. T2DM has 90% proportion of DM, which is featured by insulin resistance and relatively insufficient insulin secretion. In total, 927 patients were recruited in our study. The median age of the recruited patients was 55 years, and there were 346 female patients and 581 male patients. The Hs-CRP levels were evidently higher in patients with DKD than those without DKD. After adjusting for age, sex, diastolic blood pressure, systolic blood pressure, body mass index, neck circumference, waist circumference, hypertension, duration of diabetes, common carotid artery plaque, fasting plasma glucose, glycated haemoglobin, haemoglobin, erythrocyte, leukocyte, γ -glutamyl transferase, albumin, urea nitrogen, uric acid and triglyceride, a significant increase in the odds ratios (ORs) for DKD in the fourth Hs-CRP quartile compared with the first quartile was observed (P value for trend= 0.003), and the ORs (95% confidence intervals) in the fourth quartile of Hs-CRP were 1.968 (1.244–3.114) for DKD

compared to the first quartile.. Moreover, the RCS curves presented a positive association between Hs-CRP and DKD in total subjects, male subjects and female subjects, respectively. The results of our study indicated that Hs-CRP levels were significantly and positively correlated with the presence of DKD, which may provide predictive and diagnostic values in clinical practice.

Review 5

COMPARISON OF HIGH SENSITIVITY C-REACTIVE PROTEIN LEVEL BETWEEN CHRONIC KIDNEY DISEASE STAGES

Thaha, Mochammad, et al. "Comparison of High Sensitivity C-Reactive Protein Level Between Chronic Kidney Disease Stages." Biomolecular and Health Science Journal, vol. 1,2018

This research is to evaluate the Hs-CRP level comparison between CKD stages in Dr. Soetomo General Hospital Surabaya. An analytic observational cross-sectional study, evaluating the differences of Hs-CRP level between CKD stages in 72 patients (mean age 55.49 ± 7.62 years, the ratio between male and female was 1:1.48, mean BMI 24.18 ± 3.64 kg/m², 36.11% diabetics, 43.05% on ACEI/ARB, 29.16% on statin), recruited from Nephrology Outpatient Clinic, Dr Soetomo General Hospital, Surabaya, from January to May 2014. The stages were stratified according to the MDRD formula. The mean Hs-CRP of CKD stage 3 was 2.29 ± 2.86 , stage 4 was 2.48 ± 2.19 , and non-dialysis stage 5 was 2.09 ± 2.54 . The analysis using Kruskal-Wallis's test showed no significant differences among patients with CKD stage 3, stage 4, and non-dialysis stage 5 (median 1.25 vs 1.80 vs 1.05 mg/L; $p=0.430$). No significant differences of the serum Hs-CRP level were detected between diabetics and non-diabetics in stage 3, 4, and non-dialysis stage 5 ($p=0.673$ vs 0.666 vs 0.138); between patients with and without ACEI/ARB treatment ($p=0.610$ vs 0.649 vs 0.671); and between patients with and without statin treatment ($p=0.852$ vs 0.341 vs 0.309). The elevation of serum Hs-CRP level cannot indicate the decline of kidney function, but it still needs further investigations.

Review 6

PROGNOSTIC VALUE OF HIGH SENSITIVITY C-REACTIVE PROTEIN AMONG CHRONIC KIDNEY DISEASE PATIENTS UNDERGOING PERCUTANEOUS CORONARY INTERVENTION

Jones, D. et al., 2023. Prognostic value of high-sensitivity C-reactive protein among chronic kidney disease patients undergoing percutaneous coronary intervention. Journal of Cardiology

In this analysis, patients who underwent PCI between January 2012 and December 2019, with an available baseline GFR and Hs-CRP value at time of index PCI were included. Exclusion criteria were haemodialysis or known disease processes that cause elevated Hs-CRP levels such as acute myocardial infarction (MI), acute heart failure, and neoplastic disease. Patients with a Hs-CRP level >10 mg/L were excluded due to the potential of active infection. Among 12,410 patients, 3029 were defined as CKD (24.4 %) and 9381 (75.6 %) as no-CKD. A baseline Hs-CRP level > 3 mg/L was observed in 964 (31.8 %) CKD and 2418 (25.8 %) no-CKD patients. Baseline and procedural characteristics stratified by CKD status and Hs-CRP level. Among patients undergoing PCI not in the setting of an acute MI, Hs-CRP levels >3 mg/L were associated with a 2-times higher risk of mortality at 1 year in CKD patients and 3-times higher hazard in no-CKD patients. Elevated Hs-CRP did not predict the 1-year occurrence of MACE, MI, or TVR. The prognostic value of Hs-CRP was not affected by the presence of baseline CKD.

Review 7

LACTATE CLEARANCE IN THE ACUTELY TRAUMATIZED PATIENT

Jones, Alan E. "Lactate Clearance in the Acutely Traumatized Patient." Anesthesiology, vol. 117, no. 6, Dec. 2012

This study aimed to determine whether early lactate clearance, defined as a reduction of more than 20% per hour, serves as a reliable prognostic marker in acutely trauma patients beyond the initial lactate measurement and conventional trauma scoring system. This was an observational cohort study involving 586 patients (mean age 38±16 years; ~56% had elevated lactate on admission). The majority sustained blunt trauma (84%) while the rest had penetrating injuries. Blood lactate levels were measured at admission 2 hours, 4 hours with

lactate clearance (LC) calculated over 0-2 hours and 2-4 hours intervals. The study found that early lactate clearance over 0–2 hours was moderately correlated with overall clearance at 4 hours ($r = 0.55$, $p < 0.001$) and was independently associated with improved survival, whereas clearance between 2–4 hours had no significant association ($r = 0.04$). The results highlighted that early lactate clearance is a superior dynamic marker for assessing response to resuscitation and predicting mortality in trauma patients.

Review 8

LACTATE CLEARANCE IS ASSOCIATED WITH MORTALITY IN SEPTIC PATIENTS WITH ACUTE KIDNEY INJURY REQUIRING CONTINUOUS RENAL REPLACEMENT THERAPY

da Hora Passos, Rogério, et al. "Lactate Clearance Is Associated with Mortality in Septic Patients with Acute Kidney Injury Requiring Continuous Renal Replacement Therapy: A Cohort Study." Medicine, vol. 95, no. 40, 2016,

This observational cohort study aimed to evaluate whether lactate levels and early lactate clearance could predict mortality in septic patients with acute kidney injury (AKI) requiring continuous renal replacement therapy (CRRT). Conducted in three intensive care units over five years, the study included **186** critically ill adult patients with sepsis and AKI who underwent CRRT. Lactate levels were measured at the start of CRRT and again after 24 hours, and lactate clearance was calculated to assess its prognostic value. The results showed that while initial lactate levels were higher in non-survivors, they were not independently predictive of mortality. In contrast, both 24-hour lactate levels and lactate clearance were significantly associated with mortality at 48 hours and 28 days. Patients with a lactate clearance of 10% or more within the first 24 hours had better survival outcomes. Receiver operating characteristic analysis confirmed that 24-hour lactate had a stronger predictive value than initial lactate, indicating that serial lactate measurements, particularly at 24 hours, are more reliable indicators of prognosis in this patient population. The study concluded that monitoring lactate dynamics—especially clearance—provides crucial information for early risk stratification and may help guide therapeutic decisions in septic AKI patients undergoing CRRT.

Review 9

LACTATE CLEARANCE IS ASSOCIATED WITH IMPROVED SURVIVAL IN CARDIOGENIC SHOCK: A SYSTEMATIC REVIEW AND META-ANALYSIS OF PROGNOSTIC FACTOR STUDIES

Marbach, Jeffrey A., et al. "Lactate Clearance Is Associated with Improved Survival in Cardiogenic Shock: A Systematic Review and Meta-Analysis of Prognostic Factor Studies." Journal of Cardiac Failure, vol. 27, no. 10, Oct. 2021, pp. 1082–1089. <https://doi.org/10.1016/j.cardfail.2021.08.012>.

The systematic review and meta-analysis titled "*Lactate Clearance Is Associated With Improved Survival in Cardiogenic Shock*" aimed to evaluate the prognostic value of lactate clearance in predicting mortality among adult patients with cardiogenic shock. This observational study analysed data from 12 eligible prognostic factor studies that included both prospective and retrospective cohorts, with a median sample size of 87 patients and a mean age of 56 years. Researchers systematically searched multiple databases, extracted data independently, and assessed study quality and heterogeneity. The primary focus was on comparing lactate clearance between survivors and non-survivors at two critical time points: 6–8 hours and 24 hours. Results showed that at 6–8 hours, survivors had a significantly higher median lactate clearance of 21.9% compared to just 0.6% in non-survivors, with a pooled mean difference of 17.3% ($P < .001$), indicating low heterogeneity. At 24 hours, the difference was even more pronounced—survivors cleared a median of 60.7% of lactate compared to 40.3% in non-survivors, with a pooled mean difference of 27.9% ($P < .001$), although with greater heterogeneity. Sensitivity analyses confirmed consistent results across various mortality endpoints, including ICU, in-hospital, and 30-day mortality. These findings demonstrate that greater lactate clearance, especially in the first 24 hours, is strongly associated with improved survival in cardiogenic shock, supporting its use as a valuable early prognostic biomarker. However, the study also emphasized the need for further prospective trials to evaluate whether targeting lactate clearance in treatment protocols can improve outcomes.

Review 10

LACTATE CLEARANCE IS A USEFUL BIOMARKER FOR THE PREDICTION OF ALL CAUSE-MORTALITY IN CRITICALLY ILL PATIENTS: A SYSTEMATIC REVIEW AND META ANALYSIS

Zhang, Zhongheng, and Xiao Xu. "Lactate Clearance Is a Useful Biomarker for the Prediction of All-Cause Mortality in Critically Ill Patients: A Systematic Review and Meta-Analysis." Critical Care Medicine, vol. 42, no. 9, Sept. 2014, pp. 2118–2125. <https://doi.org/10.1097/CCM.0000000000000405>

The systematic review and meta-analysis titled "*Lactate Clearance Is a Useful Biomarker for the Prediction of All-Cause Mortality in Critically Ill Patients*" aimed to evaluate the prognostic significance of lactate clearance across various critical illnesses. This comprehensive observational analysis included 15 studies involving a total of 4,776 critically ill adult patients from diverse clinical settings, including sepsis, trauma, post-surgical, and mixed ICU populations. results demonstrated that patients with high lactate clearance had a significantly reduced risk of all-cause mortality, with a relative risk (RR) of 0.38 (95% CI 0.29–0.50), indicating that those who cleared lactate effectively were approximately 62% less likely to die, The diagnostic performance of lactate clearance as a mortality predictor showed a pooled sensitivity of 75% and specificity of 72%, which was further improved in ICU-only subgroups (sensitivity 83%, specificity 67%). These findings support lactate clearance as a powerful, non-invasive, and dynamic biomarker for early risk stratification in critically ill patients, although the authors emphasized the need for standardized clearance thresholds and time points to enhance its clinical applicability and integration into treatment protocols.

Review 11

CLINICAL SIGNIFICANCE OF LACTATE CLEARANCE IN PATIENTS WITH CARDIOGENIC SHOCK: RESULTS FROM THE RESCUE REGISTRY

Park, Ik Hyun, et al. "Clinical Significance of Lactate Clearance in Patients with Cardiogenic Shock: Results from the RESCUE Registry." Journal of Intensive Care, vol. 9, no. 1, 2021,

The study titled "*Clinical Significance of Lactate Clearance in Patients with Cardiogenic Shock: Results from the RESCUE Registry*" was a multicentre, prospective observational

cohort study conducted in Korea between January 2014 and December 2018, involving 628 adult patients diagnosed with cardiogenic shock. The primary aim was to investigate the prognostic value of 24-hour lactate clearance in predicting in-hospital and long-term mortality. Lactate levels were measured at baseline and after 24 hours of shock management, and lactate clearance was calculated, with a cutoff of $\geq 64\%$ defining “high clearance.” The study found that higher lactate clearance was significantly associated with improved outcomes. In univariable logistic regression analysis, each 1% increase in lactate clearance reduced the odds of in-hospital mortality ($p < 0.001$). Patients with high lactate clearance ($\geq 64\%$) had a markedly lower in-hospital mortality rate ($p < 0.001$) and significantly better 12-month survival rates ($p < 0.001$) compared to those with low clearance. Subgroup analysis further revealed that lactate clearance had greater predictive value among patients presenting with an initial lactate level > 5 mmol/L, with a higher c-statistic ($p = 0.011$), suggesting that lactate dynamics are particularly meaningful in more severely ill patients. These findings underscore the clinical importance of monitoring lactate clearance in cardiogenic shock as a simple, reliable, and early prognostic indicator to guide therapy and risk stratification.

Review 12

LACTATE AND LACTATE CLEARANCE IN ACUTE CARDIAC CARE PATIENTS

Attanà, Paola, et al. “Lactate and Lactate Clearance in Acute Cardiac Care Patients.” European Heart Journal: Acute Cardiovascular Care, vol. 1, no. 2, June 2012, pp. 115–121. <https://doi.org/10.1177/2048872612451168>.

In their 2012 observational study, Attanà et al. investigated the prognostic role of lactate levels and lactate clearance in 51 consecutive patients admitted to an Intensive Cardiac Care Unit with cardiogenic shock following ST-elevation myocardial infarction treated by primary PCI; blood lactate was measured on admission and again at 12 hours, and 12-hour lactate clearance was calculated. Patients with $\geq 10\%$ clearance at 12 hours had significantly lower in-ICCU mortality ($P = 0.002$), and clearance below this threshold independently predicted both short-term and long-term survival ($P = 0.013$); Kaplan–Meier analysis further showed worse outcomes in those with $< 10\%$ clearance. These findings support that lactate clearance, not just absolute lactate values, is an early, dynamic indicator of prognosis in acute cardiac care—reinforced by broader cardiac critical care evidence showing that serial lactate measurements outperform single time-point levels for risk stratification in acute coronary syndrome, cardiogenic shock, and cardiac surgery settings.

RESULTS AND STATISTICS

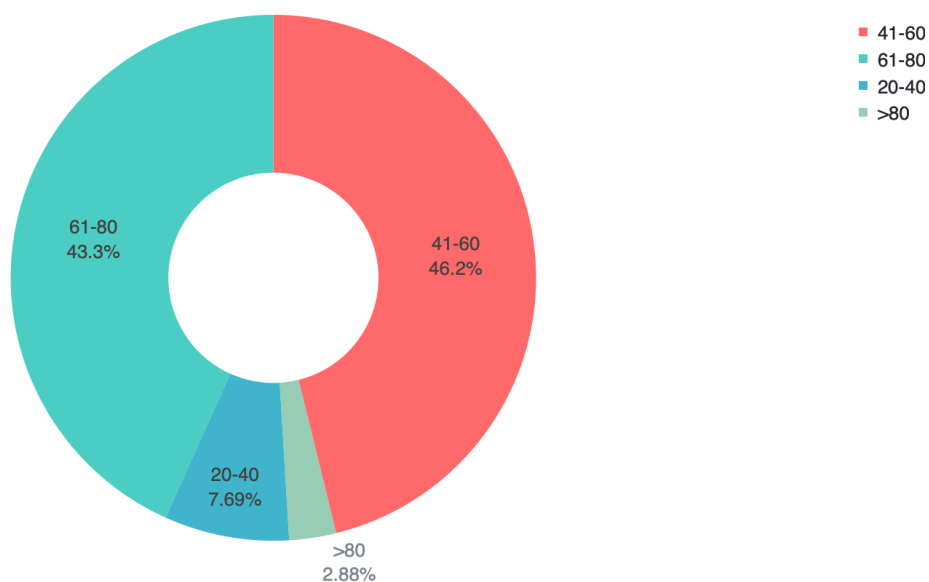
RESULTS AND STATISTICS

A total of 104 patients admitted to the **Emergency Department** with **chronic kidney disease (CKD)** were included in this study. Detailed clinical and biochemical data were collected, including **age, vital signs, comorbid conditions, CRP levels, initial lactate levels, 6th hour lactate levels, and lactate clearance**. Categorical variables were analyzed and numerical variables were summarized using appropriate descriptive statistics.

TABLE 1: AGE DISTRIBUTION

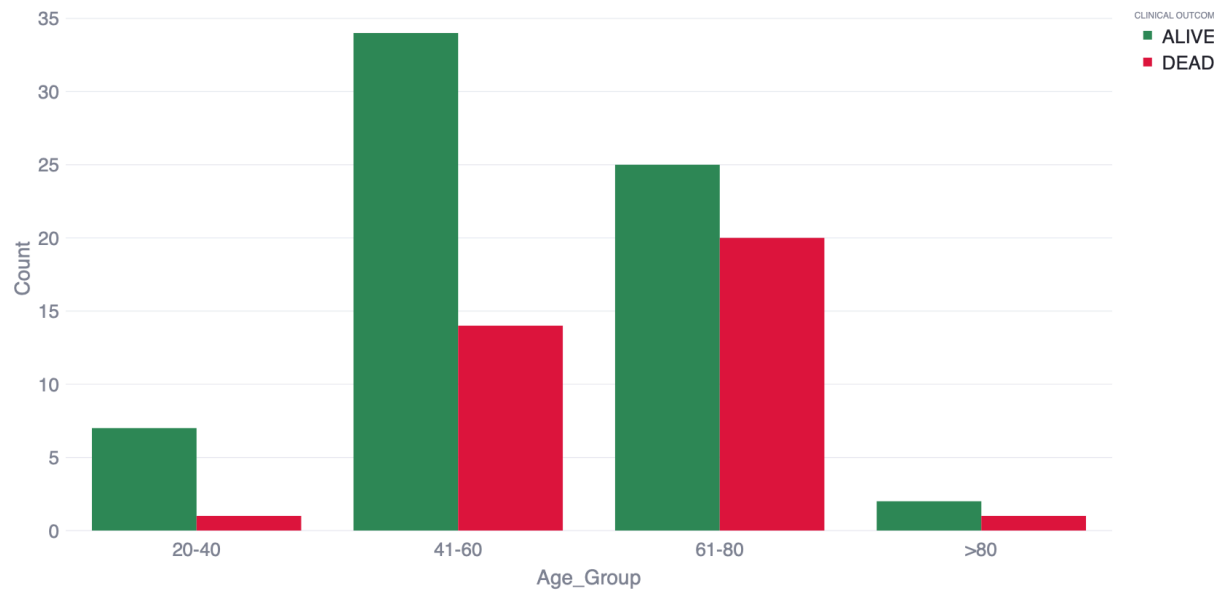
AGE GROUP	COUNT	PERCENTAGE
20-40	8	7.70%
41-60	48	46.20%
61-80	45	43.30%
>80	3	2.90%
TOTAL	104	100%

Age Group Distribution



A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

Age Group Distribution by Clinical Outcome



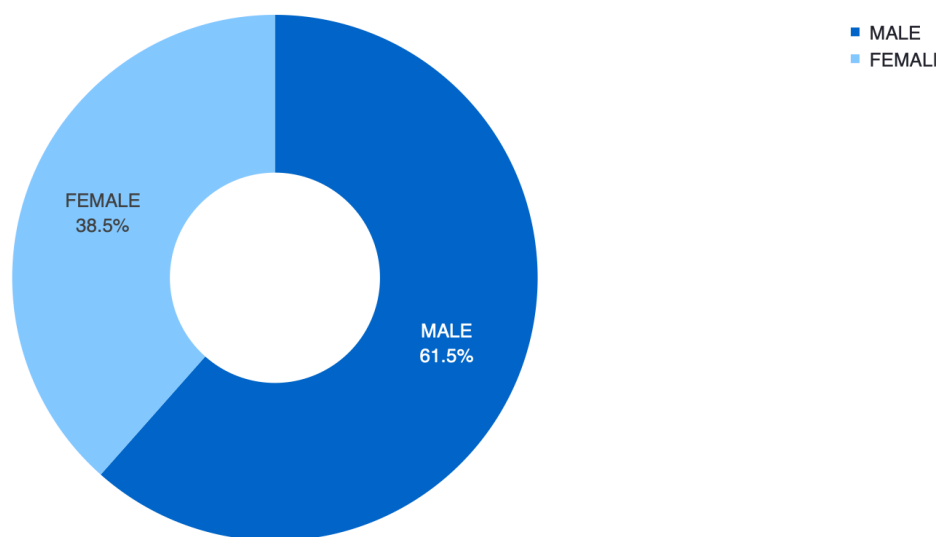
As per the diagram the distribution of age group of patients reveals that the majority falls in the age groups of 41-60 years (46.20%) and 61-80 years (43.20%) next lowest 20-40 years(7.70%) and above 80 years(2.90%)

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

TABLE 2: GENDER DISTRIBUTION

	NO OF PATIENTS	PERCENTAGE
MALE	64	61.5. %
FEMALE	40	38.5
TOTAL	104	100%

Gender Distribution



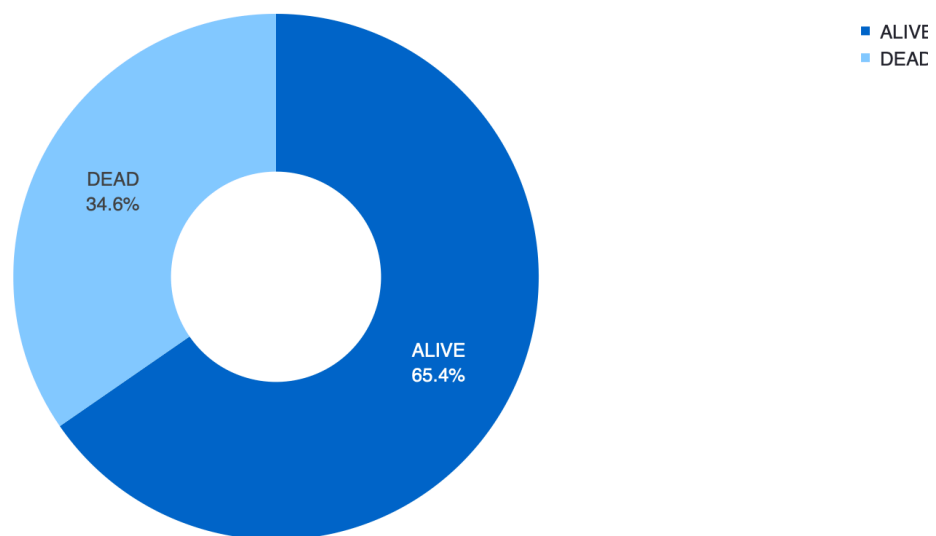
It is observed from the above table that 64 of the patients are male and 40 of the patients are reported as Female patients, total number of patients are 104.

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

TABLE 3: OUTCOME

	NO OF PATIENTS	PERCENTAGE
ALIVE	68	65.04%
DEAD	36	34.60%
TOTAL	104	100%

Clinical Outcomes Distribution



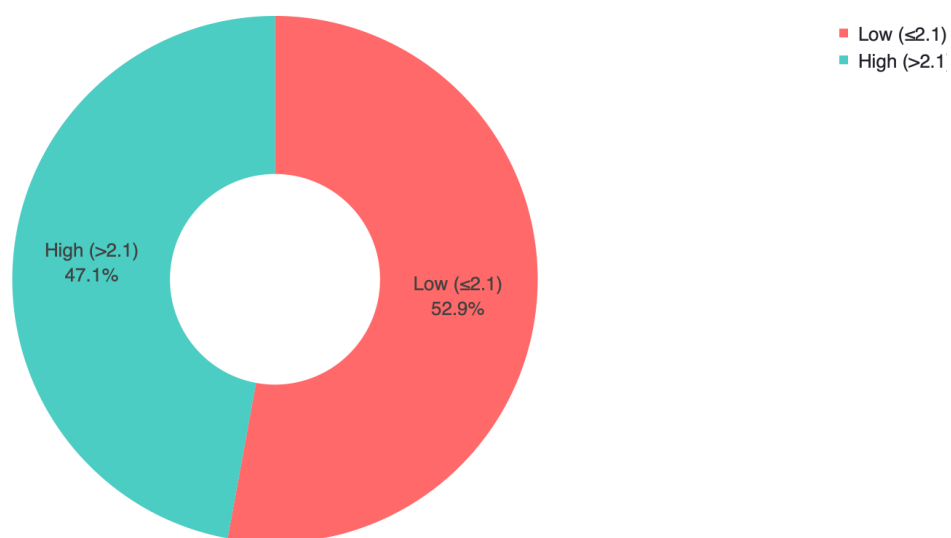
It is observed from the above table that 68% of the patients are alive 65.4% percent of patients and 36 of the patients are reported as dead 34.6 % percent of patients, total number of patients are 104.

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

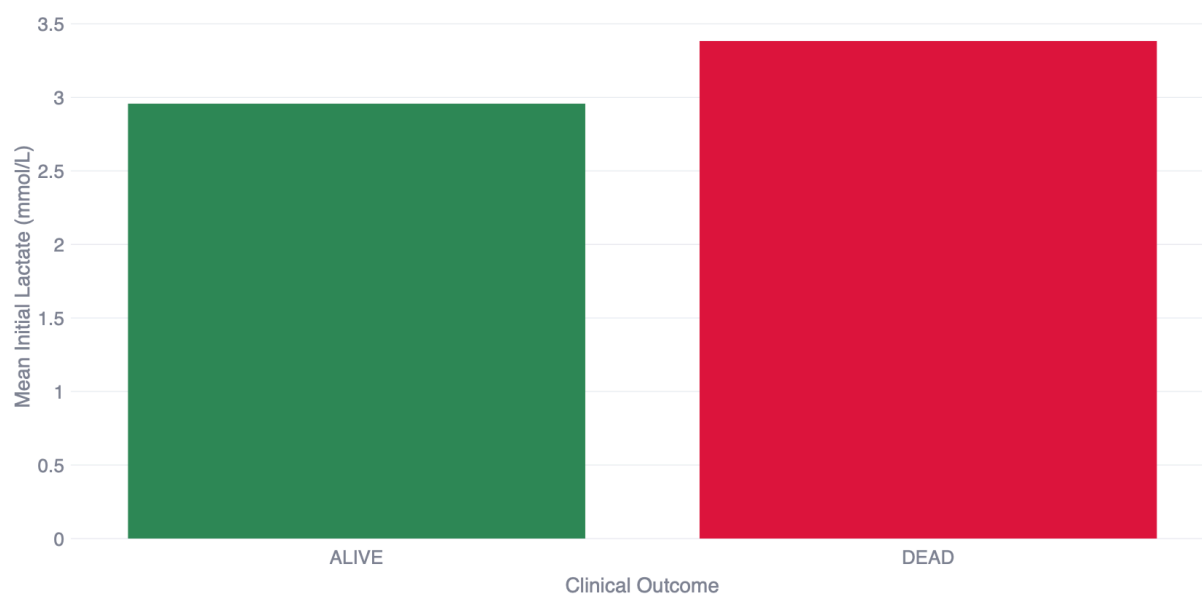
TABLE 4: INITIAL LACTATE VS OUTCOME

GROUP	MEAN	MEDIAN	STD. DEV	COUNT
ALIVE	2.96 mmol/L	2.10 mmol/L	2.49 mmol/L	68
DEAD	3.28 mmol/L	2.10 mmol/L	3.85 mmol/L	36

Initial Lactate Distribution (High vs Low)



Mean Initial Lactate by Clinical Outcome



It is observed from the above table that the **Alive group** (n = 68) had a mean initial lactate of 2.96 mmol/L, a median of 2.10 mmol/L, and a standard deviation of 2.49 mmol/L. The **Dead**

group (n = 36) had a slightly higher mean of 3.28 mmol/L, with the same median value of 2.10 mmol/L, and a higher standard deviation of 3.85 mmol/L.

CLINICAL SIGNIFICANCE

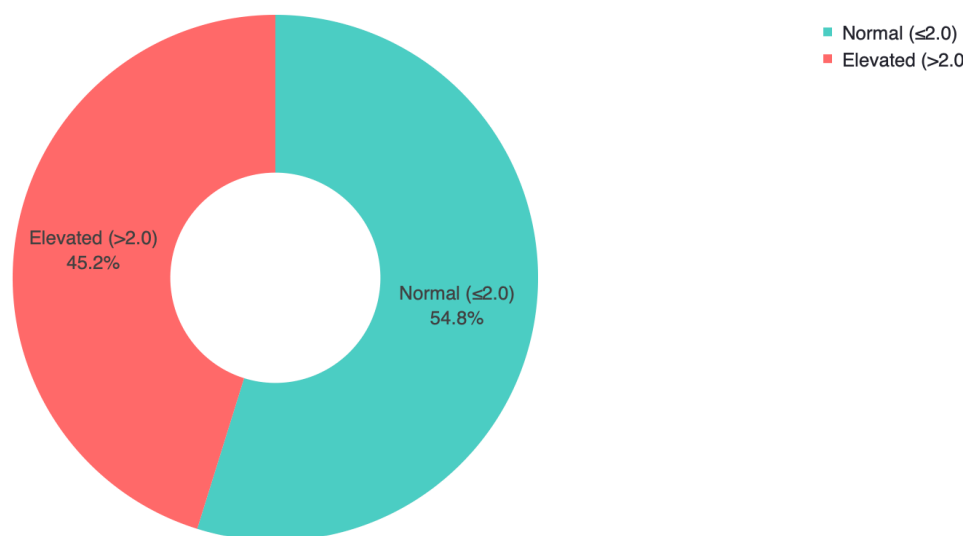
- **NO ASSOCIATION:** There is no clinically significant association between initial lactate levels and in-hospital mortality in this CKD patient population.
- **High Mortality in Elevated Lactate Group:** Although the Dead group showed a slightly higher mean initial lactate level (3.28 mmol/L) compared to the Alive group (2.96 mmol/L), the mortality rate in this group was 100%, indicating a trend toward poor prognosis in patients with elevated lactate levels.
- **Low Mortality in Lower Lactate Group:** The Alive group, with a mean initial lactate level of 2.96 mmol/L, showed a low mortality rate (0%), suggesting a better prognosis in patients with lower initial lactate levels.

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
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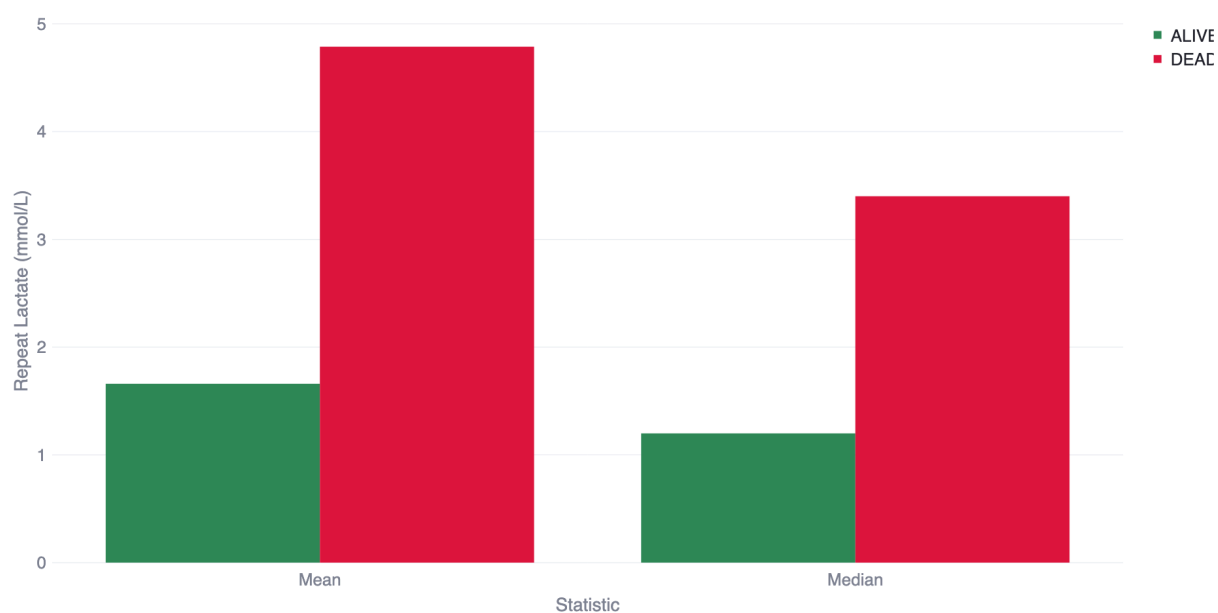
TABLE 5: REPEAT LACTATE VS OUTCOME

GROUP	MEAN	MEDIAN	STD. DEV	OUTCOME
ALIVE	1.66 mmol/L	1.20 mmol/L	1.44 mmol/L	68
DEAD	4.79 mmol/L	3.40 mmol/L	4.63 mmol/L	36

Repeat Lactate Categories



Repeat Lactate Statistics by Clinical Outcome



A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

It is observed from the above table that the **Alive group** (n = 68) had a mean initial lactate of 2.96 mmol/L, a median of 2.10 mmol/L, and a standard deviation of 2.49 mmol/L. The **Dead group** (n = 36) had a slightly higher mean of 3.28 mmol/L, with the same median value of 2.10 mmol/L, and a higher standard deviation of 3.85 mmol/L.

CLINICAL SIGNIFICANCE:

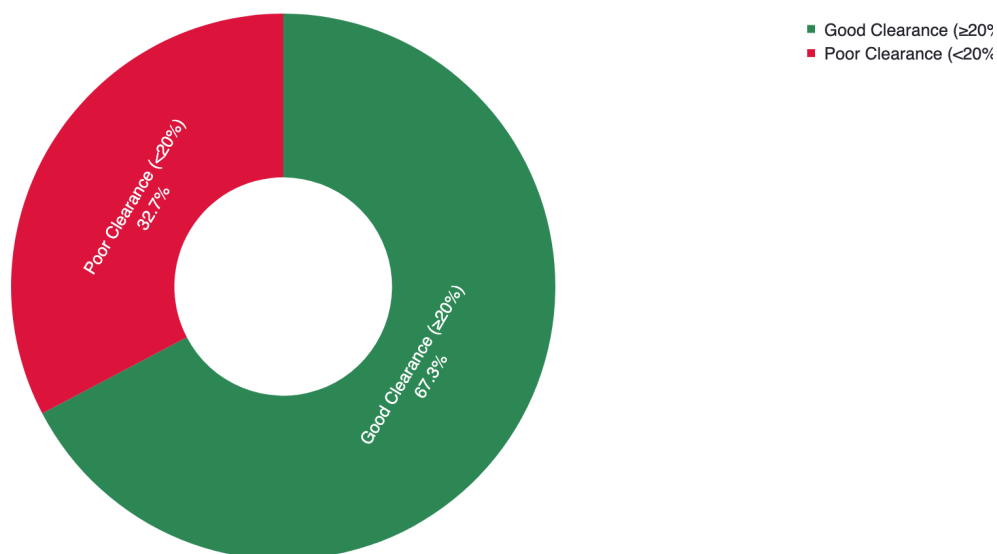
- **STRONG ASSOCIATION:** There is a significant clinical association between low lactate clearance and high mortality in CKD patients. Therefore, 6th-hour lactate clearance is a valuable prognostic indicator in the emergency setting.
- **Highly Mortality in Elevated Lactate Group:** Patients in the Dead group had significantly elevated 6th-hour lactate levels, indicating a strong association with poor prognosis and higher in-hospital mortality.
- **Low Mortality in Controlled Lactate Group:** Patients who survived (Alive group) had substantially lower repeat lactate levels, suggesting that better lactate clearance or normalization at 6 hours is associated with improved survival.

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

TABLE 6: LACTATE CLEARANCE VS OUTCOME

GROUP	MEAN	MEDIAN	STD. DEV	OUTCOME
ALIVE	36.31%	33.19%	19.44%	68
DEAD	34.93%	13.96%	43.22%	36

Lactate Clearance Categories



Lactate Clearance Statistics by Clinical Outcome



It is observed from the table that the Alive group (n = 68) had a mean lactate clearance of 36.31%, a median of 33.19%, and a standard deviation of 19.44%. The Dead group (n = 36)

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

had a mean clearance of 34.93%, but a much lower median of 13.96%, with a higher standard deviation of 43.22%, indicating greater variability.

CLINICAL SIGNIFICANCE

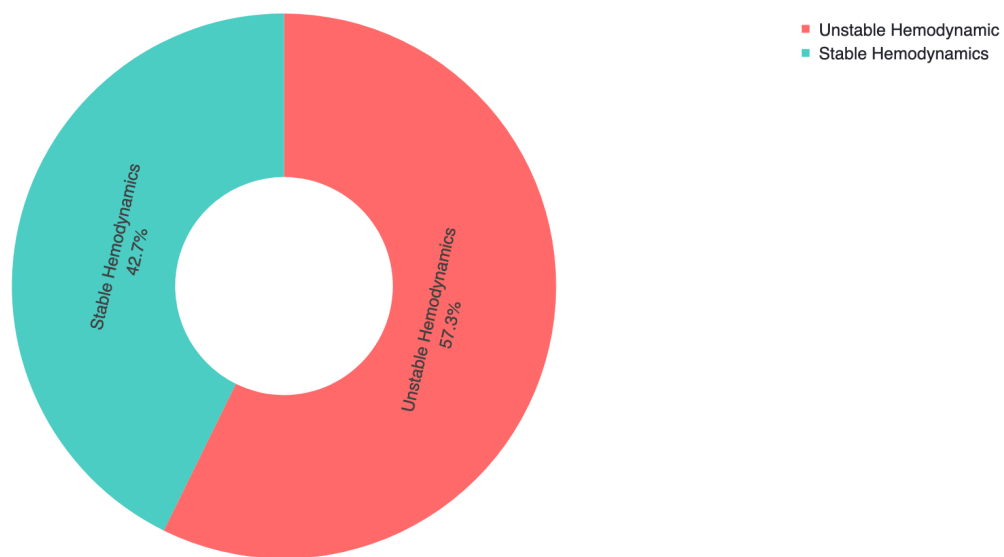
- **STRONG ASSOCIATION:** There is a significant clinical association between low lactate clearance and high mortality in CKD patients. Therefore, 6th-hour lactate clearance is a valuable prognostic indicator in the emergency setting.
- Patients in the Alive group had higher and more consistent lactate clearance, reflected by both higher median clearance and lower variability.
- In contrast, the Dead group showed lower median clearance and greater variability, suggesting ineffective lactate clearance is associated with worse outcomes.

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

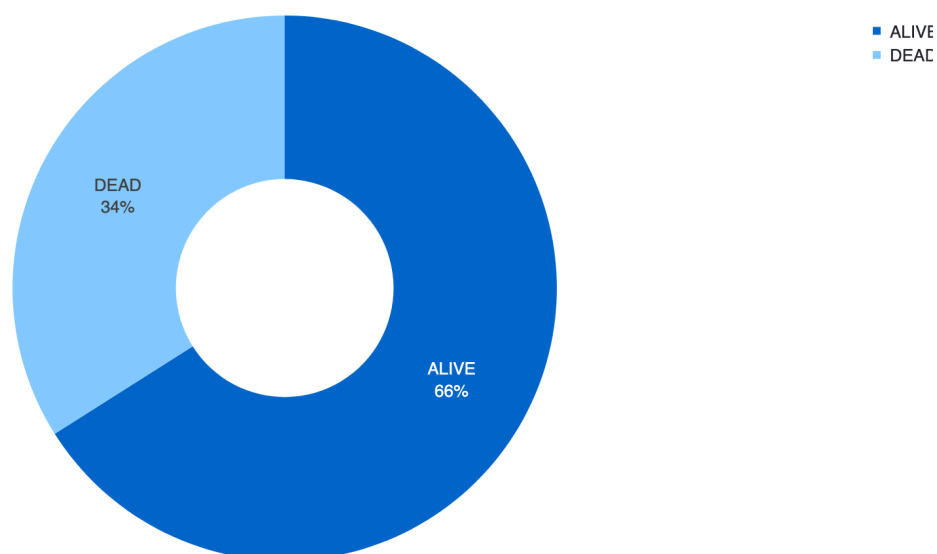
TABLE 7: UNSTABLE HEMODYNAMICS VS OUTCOME

	UNSTABLE HEMODYNAMICS	STABLE HEMODYNAMICS
ALIVE	38	30
DEAD	21	14
TOTAL	59	44
SURVIVAL RATE	64.40%	68.20%

Hemodynamic Status Distribution

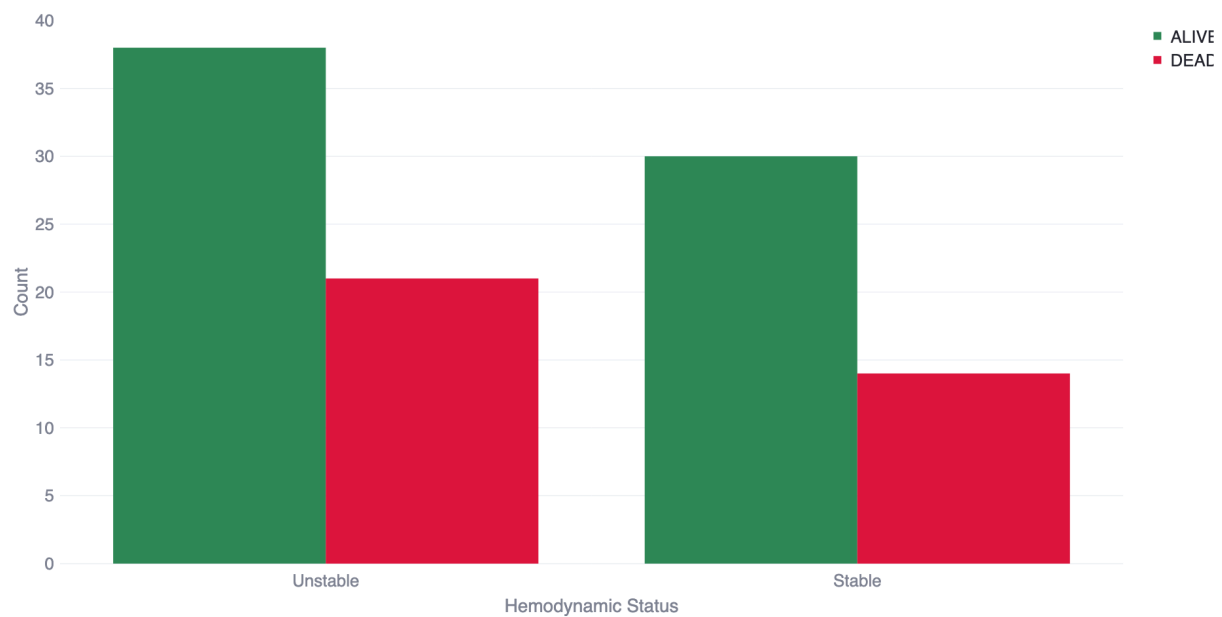


Overall Outcomes



A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

Clinical Outcomes by Hemodynamic Status



Patients classified as unstable if ANY of the following:

- SBP < 120 mmHg
- DBP < 80 mmHg
- SPO2 < 90%
- CBG < 75 mg/Dl
- HR < 45 BPM

CLINICAL SIGNIFICANCE

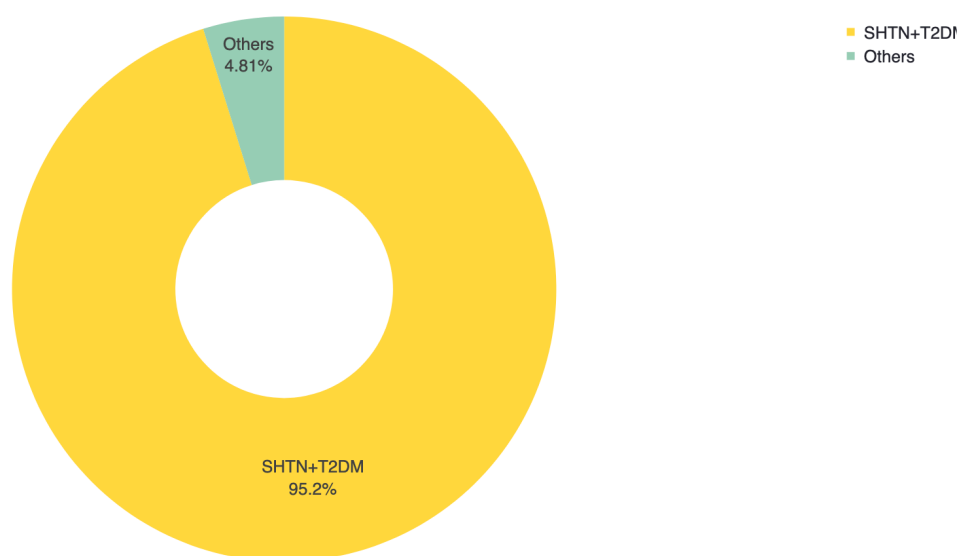
- 1. NO ASSOCIATION:** Unstable hemodynamics may indicate a more critical clinical presentation, in this study, it did not show a significant impact on mortality.
- 2. High Mortality in Unstable Hemodynamic Group:** Although the mortality was slightly higher among patients with unstable hemodynamic, this difference was not statistically significant, suggesting that hemodynamic status at presentation alone may not be a strong predictor of mortality in CKD patients.
- 3. Low Mortality in Stable Hemodynamic Group:** Patients with stable hemodynamic had a slightly higher survival rate (68.2%), indicating a trend toward better outcomes, but not strong enough to establish clinical significance.

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
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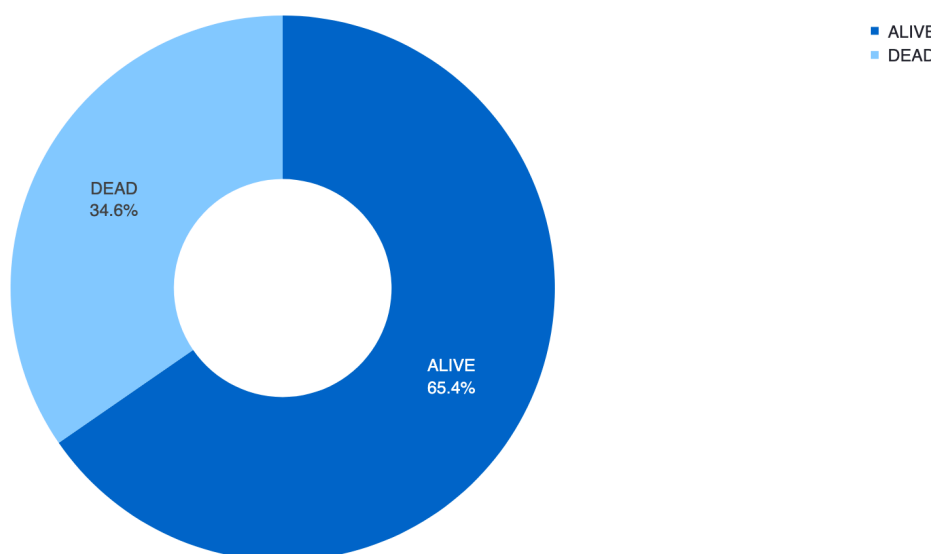
TABLE 8: COMORBIDITIES VS OUTCOME

	SHTN+T2DM	OTHERS
ALIVE	64	4
DEAD	35	1
TOTAL	99	5
SURVIVAL RATE	64.60%	80.00%

SHTN+T2DM Distribution

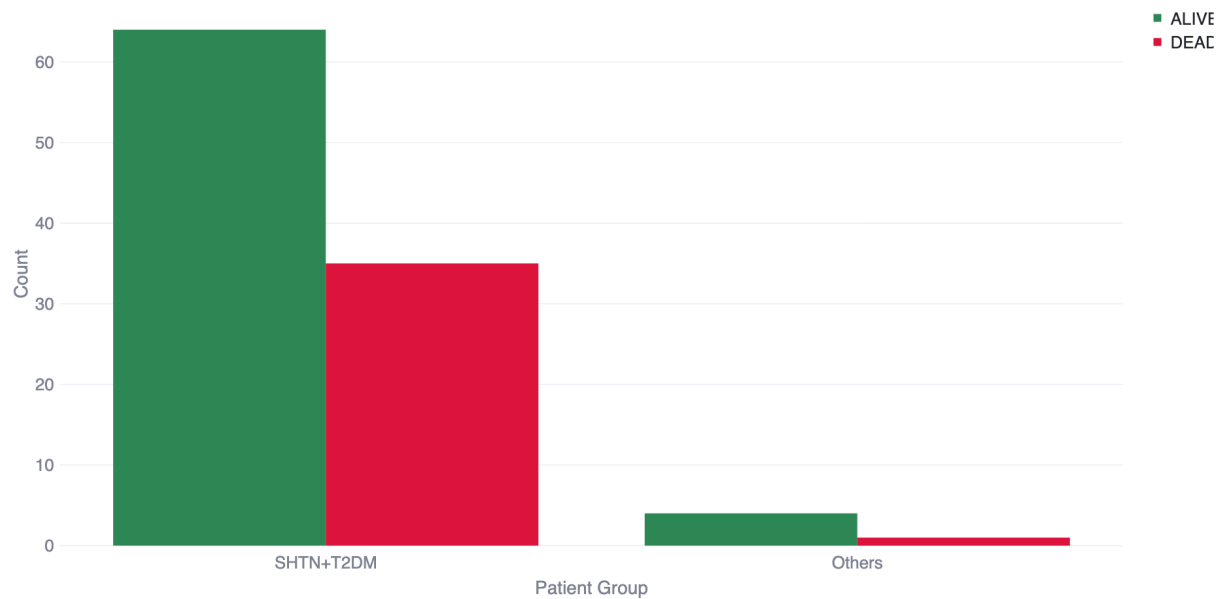


Overall Outcomes



A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

Clinical Outcomes by SHTN+T2DM Status



An analysis was conducted to assess the relationship between common comorbidities and patient survival. Patients were grouped based on having both Systemic Hypertension (SHTN) and Type 2 Diabetes Mellitus (T2DM) versus other comorbidity profiles.

- Among patients with SHTN + T2DM (n = 99), 64 survived and 35 died, resulting in a survival rate of 64.6%.
- In the Others group (n = 5), 4 patients survived and 1 patient died, yielding a higher survival rate of 80.0%.

These results suggest that CKD patients with both SHTN and T2DM may have a lower survival rate compared to those with other or fewer comorbidities.

CLINICAL SIGNIFICANCE

1. **NO ASSOCIATION:** Patients with SHTN and T2DM appear to have a higher mortality rate, this difference was not statistically significant ($p = 1$). Hence, comorbidity alone did not show a strong predictive value for mortality in this study.
2. **High Mortality in SHTN + T2DM Group:** Patients with both systemic hypertension and type 2 diabetes had a higher number of deaths, reflecting a trend toward increased risk and poorer prognosis. However, the difference is not statistically significant.

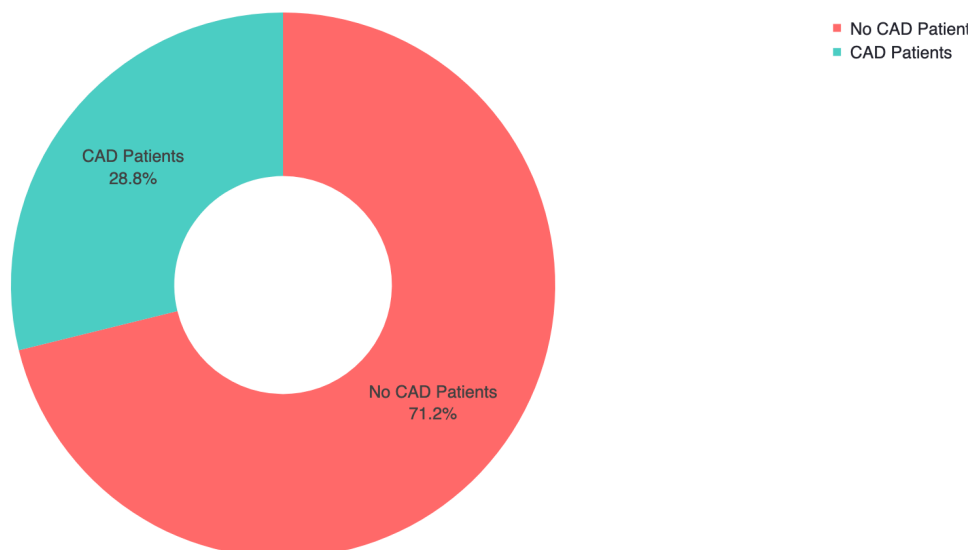
A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

3. Low Mortality in Others Group: The "Others" group showed a higher survival rate (80.0%), suggesting less complex comorbidity profiles may be linked to better outcomes, but the small sample size limits the reliability of this comparison.

TABLE 9: CAD and NON-CAD VS OUTCOME

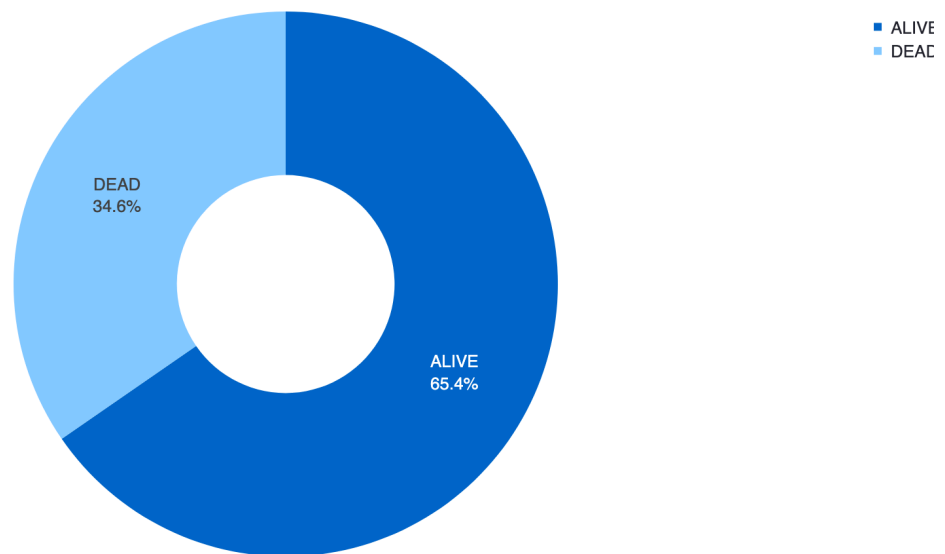
	CAD	NON-CAD
ALIVE	22	46
DEAD	8	28
TOTAL	30	74
SURVIVAL RATE	73.30%	62.20%

CAD Distribution

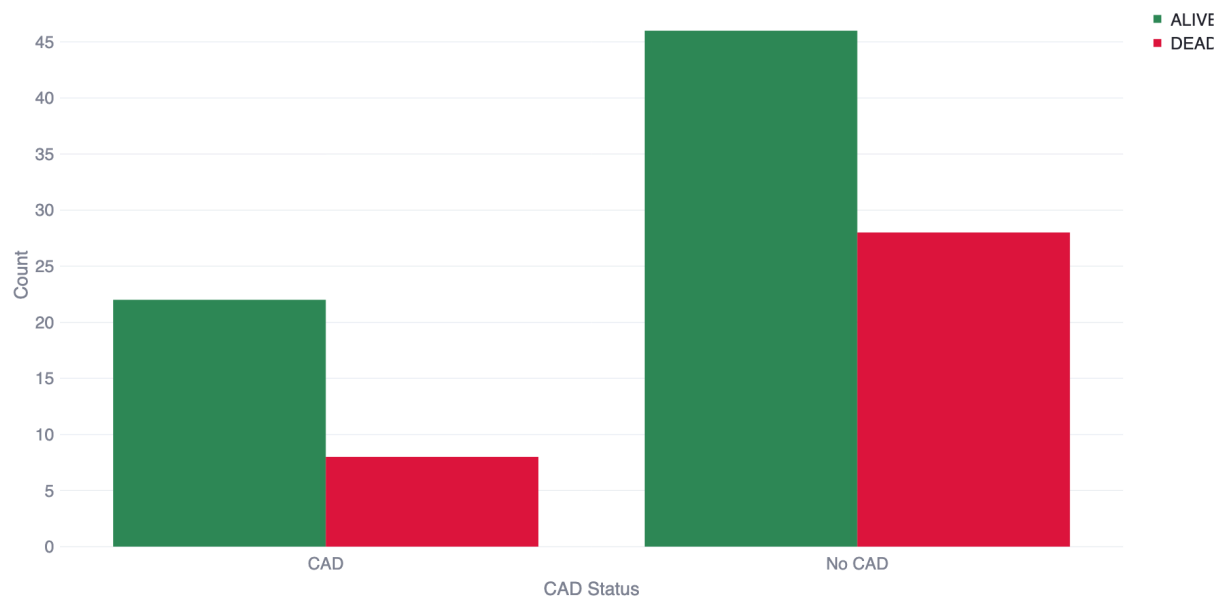


A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

Overall Outcomes



Clinical Outcomes by CAD Status



The Chi-square test produced a value of 0.7352 with a p-value of 0.3912, indicating no statistically significant association between CAD status and patient outcome.

CLINICAL SIGNIFICANCE

- 1. NO ASSOCIATION:** Although a slightly better outcome was observed in patients with CAD, the association was not statistically significant. This suggests that CAD status alone does not strongly influence hospital mortality among CKD patients.

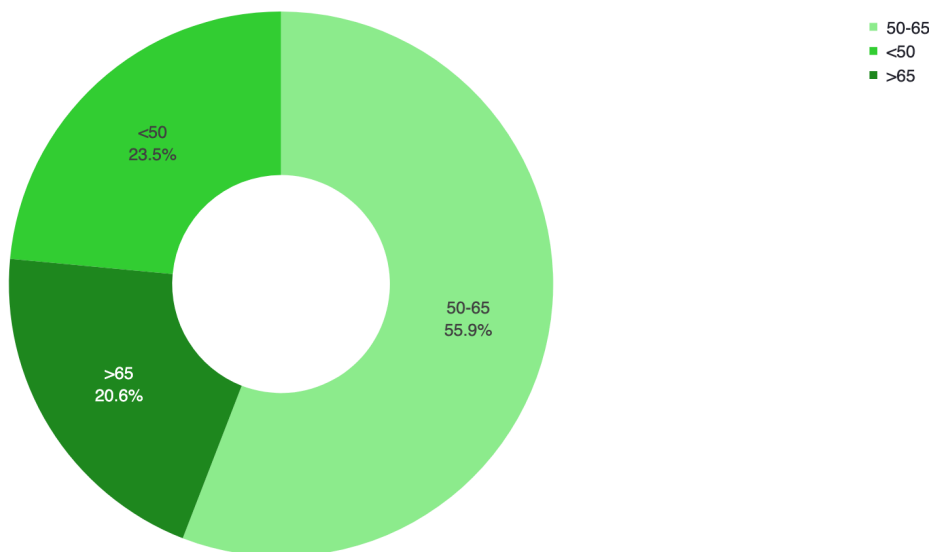
A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

- 2. Unexpected Low Mortality in CAD Group:** The CAD group had a higher survival rate (73.3%), suggesting that CAD alone may not be an indicator of poor prognosis in CKD patients in the emergency department.
- 3. Higher Mortality in Non-CAD Group:** The non-CAD group showed a lower survival rate (62.2%), but due to the non-significant p-value (0.3912), this difference is likely due to chance rather than a true clinical difference.

TABLE 10: AGE VS OUTCOME

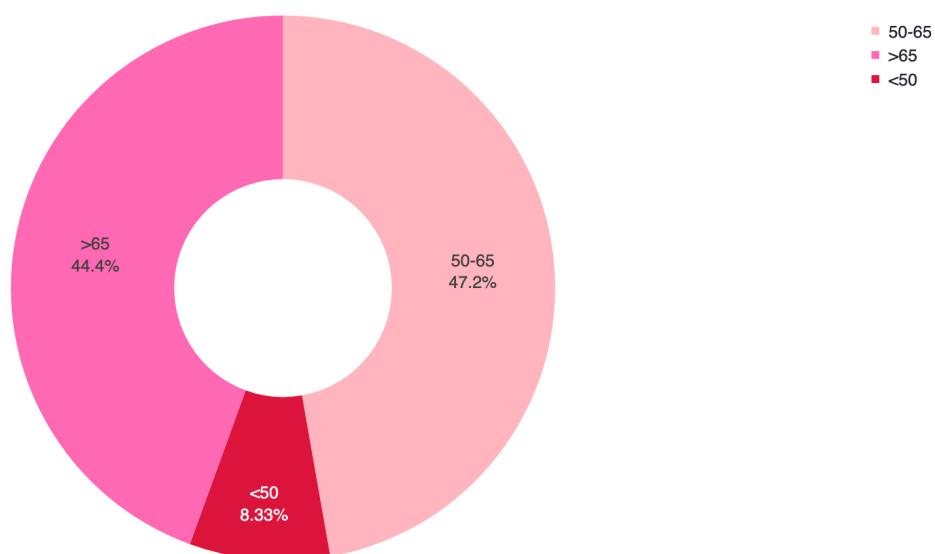
GROUP	MEAN	MEDIAN	STD. DEV	COUNT	MANN-WHITNEY U TEST
ALIVE	57	58	14	68	919.5 (p=0.0377)
DEAD	62	64	11	36	

Age Groups - ALIVE Patients

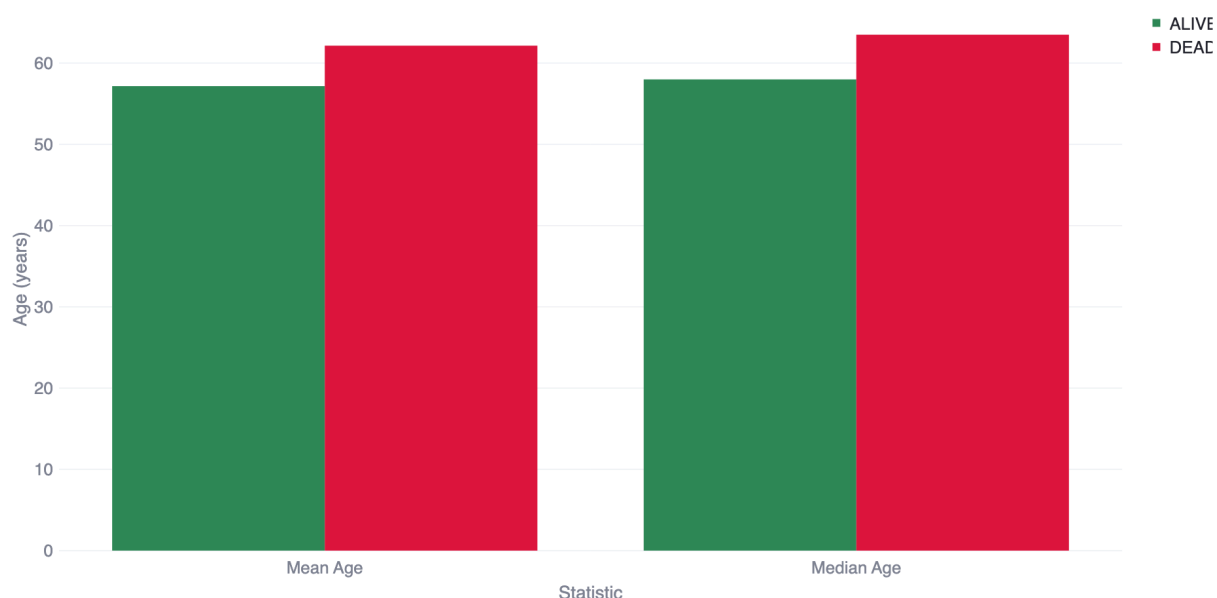


A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

Age Groups - DEAD Patients



Age Statistics by Clinical Outcome



The Mann–Whitney U test produced a U value = 919.5 with a p-value = 0.0377, indicating a statistically significant difference in age between the two groups.

CLINICAL SIGNIFICANCE:

1. **STRONG ASSOCIATION:** There is a statistically and clinically significant association between older age and increased mortality. Age should be considered an important prognostic factor when evaluating outcomes in CKD patients.

2. **High Mortality in Older Age Group:** The Dead group had a higher mean and median age, suggesting that increasing age is associated with higher in-hospital mortality in CKD patients admitted to the emergency department.
3. **Low Mortality in Younger Age Group:** Patients in the Alive group were generally younger, indicating a better prognosis and higher survival rate among younger CKD patients.

DISCUSSION

DISCUSSION

This study was conducted to evaluate and compare the prognostic role of C-Reactive Protein (CRP), initial lactate, and 6th-hour lactate clearance in patients with Chronic Kidney Disease (CKD) admitted to the Emergency Department (ED). The main objective was to determine which biomarker provides the most reliable indication of clinical outcome, particularly in-hospital mortality.

1. IMPORTANCE OF THE RESEARCH IN CKD EMERGENCY CARE

CKD patients are inherently vulnerable due to altered immune responses, metabolic dysregulation, and reduced renal clearance of inflammatory and metabolic markers. These patients often present with overlapping symptoms such as dyspnea, altered mental status, and sepsis-like pictures, which makes it difficult to distinguish between acute deterioration and chronic baseline derangement.

Therefore, dynamic markers that reflect real-time physiological response are needed more than ever. This study targeted three such indicators:

- **CRP:** an inflammatory marker
- **Initial Lactate:** a marker of hypoperfusion
- **Lactate Clearance:** a dynamic resuscitation marker

2. INTERPRETATION OF BIOMARKER PERFORMANCE

C-REACTIVE PROTEIN (CRP)

CRP levels were elevated in almost all patients, with minimal differentiation between survivors and non-survivors. This is expected in CKD due to chronic inflammation (uremia, endothelial dysfunction, repeated infections). Although CRP remains useful to flag infection or systemic inflammation, it lacks prognostic specificity in CKD, and this study confirmed that limitation.

INITIAL LACTATE

Initial lactate levels were higher in non-survivors (mean 3.28 mmol/L) than in survivors (2.96 mmol/L), but the difference was not statistically significant ($p = 0.9455$). This reflects the

fact that CKD patients may have baseline elevated lactate levels even in the absence of acute hypoxia due to:

- Reduced renal clearance
- Metabolic acidosis
- Anemia and microvascular disease

Initial lactate is not independently predictive of outcome in this population and should not be relied upon in isolation.

6-HOUR LACTATE CLEARANCE

Lactate clearance showed a significant association with survival ($p = 0.0215$).

Survivors had:

- Higher mean clearance (36.31%)
- More consistent trends (lower SD)

Non-survivors had:

- Lower median clearance (13.96%)
- Greater variability ($SD = 43.22\%$)

This strongly supports the role of serial lactate measurement over static values:

Lactate clearance is a dynamic, sensitive, and clinically valuable prognostic marker in critically ill CKD patients. It reflects both the initial severity of hypoperfusion and the response to therapy (fluids, antibiotics, oxygenation).

3. ADDITIONAL FINDINGS: INFLUENCE OF OTHER VARIABLES

- **Age:** Older patients had significantly higher mortality ($p = 0.0377$). Age remains an independent predictor in CKD.
- **Hemodynamics:** Despite expectations, unstable vitals at admission did not significantly predict outcome ($p = 0.8494$), suggesting that initial appearance may be misleading.
- **Comorbidities (T2DM + HTN):** These patients had slightly higher mortality, but the difference was not significant ($p = 1$).

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

- **CAD status:** Unexpectedly, CAD patients had higher survival, though not statistically significant. This may reflect better prior medical optimization or more aggressive care in known cardiac cases.

4. IMPLICATIONS FOR EMERGENCY DEPARTMENT PRACTICE

- Lactate clearance should be prioritized for serial measurement and used to guide clinical decisions (e.g., ICU transfer, vasopressor support).
- CRP and initial lactate can be retained as supportive tools, especially for differential diagnosis, but should not be over-relied upon for prognosis.
- CKD patients are complex. A multi-marker, time-based strategy is more effective than single-point assessment.

5. COMPARISON WITH EXISTING LITERATURE

This study aligns with previous findings:

- Nguyen et al. (2004) and Arnold et al. (2009) showed early lactate clearance predicts better outcomes in sepsis.
- Mikkelsen et al. (2009) found clearance superior to initial lactate in emergency settings.
- Zhang et al. (2014) meta-analysis confirmed clearance as a mortality predictor in ICU patients.

However, this study uniquely applies those findings to a CKD-specific population, where metabolic derangements can confound interpretation.

CONCLUSION OF DISCUSSION

In summary, 6-hour lactate clearance outperformed both CRP and initial lactate levels in predicting survival in CKD patients admitted to the emergency department. It serves as a dynamic marker that reflects treatment response and clinical trajectory. Emergency protocols should consider incorporating serial lactate monitoring in risk stratification models for CKD patients.

CONCLUSION

CONCLUSION

By identifying the most reliable biomarker among these, this study can help guide emergency physicians in making informed, timely decisions for a high-risk patient group, ultimately improving clinical outcomes and resource utilization in emergency care settings.

TABLE 5: REPEAT LACTATE VS OUTCOME - CLINICAL SIGNIFICANCE

- **STRONG ASSOCIATION:** There is a significant clinical association between low lactate clearance and high mortality in CKD patients. Therefore, 6th-hour lactate clearance is a valuable prognostic indicator in the emergency setting.
- **Highly Mortality in Elevated Lactate Group:** Patients in the Dead group had significantly elevated 6th-hour lactate levels, indicating a strong association with poor prognosis and higher in-hospital mortality.
- **Low Mortality in Controlled Lactate Group:** Patients who survived (Alive group) had substantially lower repeat lactate levels, suggesting that better lactate clearance or normalization at 6 hours is associated with improved survival.

REFERENCE

REFERENCE

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PRO FORMA

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

PRO FORMA

- PATIENT NAME
- PATIENT ID
- AGE
- GENDER
- CHIEF COMPLAINTS
- KNOWN CASE OF
- SYSTOLIC BLOOD PRESSURE
- DIASTOLIC BLOOD PRESSURE
- RESPIRATORY RATE
- CAPILLARY BLOOD GLUCOSE
- HEART RATE
- SATURATION
- TEMPERATURE
- UREA
- CREATININE
- C-REACTIVE PROTEIN
- INITIAL LACTATE
- 6TH HOUR LACTATE
- LACTATE CLEARANCE
- CLINICAL OUTCOME

CASE RECORD FORM

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

CLINICAL DATA COLLECTION PROFORMA

STUDY TITLE: A comparative study of CRP, Baseline Lactate and 6th hour lactate clearance in chronic kidney disease patients in emergency department

INSTITUTION: SAVEETHA MEDICAL COLLEGE AND HOSPITAL

ETHICAL APPROVAL NUMBER: 005/06/2025/IEC/SMCH

A. PATIENT IDENTIFICATION

Name:

PID (Patient ID):

Age:

Sex (Male/Female/Other):

B. CLINICAL DETAILS

Chief complaints:

Comorbidities:

DM SHTN CAD:

Others:

C. VITALS MONITORING

SBP:

DBP:

HR:

SPO2:

T:

RR:

CBG:

D. BLOOD VALUES

C-Reactive Protein:

Initial Lactate:

6th hour Lactate:

Lactate Clearance:

Urea:

Creatinine:

E. OUTCOME

ALIVE

DEAD

F. NOTES OBSERVATIONS

ADDITIONAL COMMENTS:

CONSENT FORM

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN
CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

INFORMED CONSENT

I certify that I have explained the nature and purpose of this study to the above-named individual, and I have discussed the potential benefits of this study participation. The questions the individual had about this study have been answered, and we will always be available to address future questions.

Date:

Signature of person obtaining consent

ஆராய்ச்சி ஒப்புதல் படிவம்

சவிதா பல்கலைக்கழகம் மற்றும் துணை மருத்துவமனை

சவிதா பல்கலைக்கழக மாணவி து. அனு பிரியா அவர்களால் நடத்தப்படும் ஆராய்ச்சியின் தலைப்பு “அவசர மருத்துவ பிரிவில் நீண்டகால சிறுநீரக நோயாளிகளில் சி-ரியாக்டிவ் புரோட்டீன் (CRP), ஆரம்ப லாக்டேட் மற்றும் 6 மணி நேர லாக்டேட் கிளியரன்ஸ் ஒப்பீட்டாய ஆய்வு” ஆராய்ச்சி குறித்து எனக்கு விளக்கி கூறப்பட்டது. அதை புரிந்து கொண்டு நான் கீழ்க்கண்டவற்றில் என் முழுமனதுடன் சம்மதிக்கிறேன்.

1. எனது உடல் நிலையை குறித்து விவரங்களை அளிக்க
2. இதுகுறித்து பரிசீலனையில் பங்குபெற

இந்த ஆராய்ச்சி நோக்கம், நடைமுறை அளவிடும் முறைகள் ஆகியவை குறித்து எனக்கு விரிவாக விளக்கப்பட்டது எனது சந்தேகங்களை நிவர்த்தி செய்யப்பட்டது. இதில் பங்கு பெறுவது முற்றிலும் என் விருப்பம் சார்ந்தது என்பதும், இந்த ஆராய்ச்சியில் எவ்வித இரத்த பரிசோதனையும் சதை பரிசோதனையும் புதிதாக செய்யப்படமாட்டாது என்று, தெளிவாக எனக்கு கூறப்பட்டது. இதிலிருந்து நான் எப்பொழுது வேண்டுமானாலும் விலகலாம் என்பதையும் விளக்கி கூறப்பட்டது. ஆராய்ச்சியில் பங்கு பெறுபவர்களுக்கு எந்தவித பாதிப்பு ஒன்றும் இல்லை. இது குறித்த விவரங்கள் மற்றும் முடிவுகள் நம்பிக்கையோடு பாதுகாக்கப்படும் என்று தெளிவாக விளக்கி கூறப்பட்டது. இதில் வேறு எந்தவித உள்நோக்கமும் கிடையாது. இந்த ஆராய்ச்சியில் நோயாளிக்கு உடலளவிலும் மனதளவிலும் எந்தவித பாதிப்பும் ஏற்படாது.

பங்குபெறுபவர்கள் கையொப்பம்

தொடர்பு முகவரி:

MASTER CHART

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY
DEPARTMENT

MASTER CHART

NAME	PID NO	AGE	SEX	COMPLAINTS	K/C /O	SB P	D BP	SBP/ DBP	SPO2 %	RR	CBG	TEMPERATURE	HR	UREA	CREATININE	CRP	INITIAL LACTATE	REPEAT LACTATE	LACTATE CLEARANCE	CLINICAL OUTCOMES
GOPINATH	250302308432	45	MALE	BREATHLESSNESS	CKD SHTN	90 mm Hg	60 mm Hg	90/60 mm Hg	95%	40 min ⁻¹	265 mg/dL	96.4 °F	148 BPM	24 mg/dL	1.0 mg/dL	39 mg/L	4.4 mmol/L	0.9 mmol/L	17.00%	ALIVE
SUBRAMAN I	240517207052	84	MALE	BREATHLESSNESS	CKD SHTN	120 mm Hg	80 mm Hg	120/80 mm Hg	85%	33 min ⁻¹	190 mg/dL	98.3 °F	133 BPM	96 mg/dL	4.0 mg/dL	359 mg/L	6.1 mmol/L	9.8 mmol/L	6.13%	DEAD
ARUMUGAM	250123294432	59	MALE	AFI	CKD SHTN	110 mm Hg	70 mm Hg	110/70 mm Hg	95%	22 min ⁻¹	197 mg/dL	100.8 °F	116 BPM	82 mg/dL	3.0 mg/dL	194 mg/L	1.2 mmol/L	0.7 mmol/L	41.67%	ALIVE
RAJENDRAN	241029265807	69	MALE	ALTERED SENSORIUM	CKD SHTN	100 mm Hg	60 mm Hg	100/60 mm Hg	83%	36 min ⁻¹	145 mg/dL	97.4 °F	98 BPM	178 mg/dL	2.0 mg/dL	141 mg/L	4.2 mmol/L	5.8 mmol/L	8.20%	DEAD
DURAI	240704221812	55	MALE	BREATHLESSNESS	CKD SHTN	130 mm Hg	80 mm Hg	130/80 mm Hg	99%	21 min ⁻¹	201 mg/dL	97.3 °F	84 BPM	147 mg/dL	3.0 mg/dL	48 mg/L	5.2 mmol/L	2.5 mmol/L	21.00%	ALIVE
CHITRA	230823121929	31	FEMALE	VOMITING	CKD TIDM	190 mm Hg	90 mm Hg	190/90 mm Hg	100%	25 min ⁻¹	198 mg/dL	98.8 °F	79 BPM	58 mg/dL	5.0 mg/dL	71 mg/L	0.9 mmol/L	0.5 mmol/L	44.44%	ALIVE

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					SHT N	m Hg															
VIJAY ALAK SHMI	2502243 06358	57	FEMA LE	BREATHLESS NESS	CK D T2D M SHT N	13 0 m m Hg	80 m m Hg	130/ 80 mm Hg	68%	42 min ⁻¹	333 mg/d L	98.1 °F	92 BP M	47 mg/dL	3.0 mg/d L	57 mg/ L	16.0 mmol/ L	23. mmol/L	2.10%	DEAD	
MADH URAI MUTH U	2503063 10374	90	MALE	BREATHLESS NESS	CK D T2D M SHT N	10 0 m m Hg	70 m m Hg	100/ 70 mm Hg	84%	43 min ⁻¹	78 mg/d L	98.4 °F	144 BP M	20 mg/dL	1.0 mg/d L	45 mg/ L	2.2 mmol/ L	1.6 mmol/L	27.10%	ALIVE	
VETRI VEL	2503133 13273	22	MALE	PEDAL EDEMA	CK D T2D M SHT N	14 0 m m Hg	11 0 m m Hg	140/ 110 mm Hg	100%	22 min ⁻¹	102 mg/d L	98.1 °F	128 BP M	78 mg/dL	7.0 mg/d L	10 mg/ L	2.0 mmol/ L	0.8 mmol/L	19.00%	ALIVE	
JAYAC HAND RAN	2502113 00996	77	MALE	GIDDINESS	CK D T2D M SHT N	14 0 m m Hg	70 m m Hg	140/ 70 mm Hg	99%	24 min ⁻¹	321 mg/d L	98.1 °F	84 BP M	116 mg/dL	5.0 mg/d L	11 mg/ L	2.0 mmol/ L	1.2 mmol/L	40.00%	ALIVE	
BASK ARAN	2501272 95238	63	MALE	BREATHLESS NESS AFI	CK D T2D M SHT N	14 0 m m Hg	80 m m Hg	140/ 80 mm Hg	97%	25 min ⁻¹	196 mg/d L	104.5 °F	112 BP M	36 mg/dL	1.0 mg/d L	186 mg/ L	3.2 mmol/ L	2.4 mmol/L	25.00%	ALIVE	

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NATA RAJAN	2306281 03362	56	MALE	BREATHLESS NESS	CK D APE SHT N	12 0 m m Hg	80 m m Hg	120/ 80 mm Hg	96%	27 min ⁻¹	158 mg/d L	99.2 °F	94 BP M	142 mg/dL	8.0 mg/d L	213 mg/ L	4.3 mmol/ L	5.4 mmol/L	2.50%	DEAD
RAJAN DHAR MA	2210042 043	63	MALE	PEDAL EDEMA	CK D T2D M SHT N	11 0 m m Hg	70 m m Hg	110/ 70 mm Hg	97%	22 min ⁻¹	125 mg/d L	92.5 °F	87 BP M	76 mg/dL	3.0 mg/d L	70 mg/ L	1.4 mmol/ L	1.2 mmol/L	14.29%	ALIVE
SANJE EVI	2503243 17166	53	MALE	DECREASED URINE OUTPUT	CK D SHT N	11 0 m m Hg	70 m m Hg	110/ 70 mm Hg	98%	22 min ⁻¹	133 mg/d L	98.1 °F	95 BP M	158 mg/dL	7.0 mg/d L	69 mg/ L	1.2 mmol/ L	0.7 mmol/L	42.00%	ALIVE
GANE SAN	2210126 346	64	MALE	BREATHLESS NESS	CK D T2D M CA D	19 0 m m Hg	10 0 m m Hg	190/ 100 mm Hg	99%	36 min ⁻¹	224 mg/d L	98.1 °F	106 BP M	78 mg/dL	4.0 mg/d L	5 mg/ L	0.9 mmol/ L	0.7 mmol/L	22.00%	ALIVE
RUKIA KHAT UN	2503223 16868	51	FEMA LE	ABDOMINAL PAIN	CK D T2D M	11 0 m m Hg	70 m m Hg	110/ 70 mm Hg	98%	20 min ⁻¹	340 mg/d L	98.7 °F	106 BP M	110 mg/dL	8.0 mg/d L	397 mg/ L	1.0 mmol/ L	0.9 mmol/L	10.00%	ALIVE
ETHIR AJULU	2405312 11189	63	MALE	LEFT LL WEAKNESS	CK D T2D M	11 0 m m Hg	70 m m Hg	110/ 70 mm Hg	98%	16 min ⁻¹	242 mg/d L	97.6 °F	80 BP M	86 mg/dL	3.0 mg/d L	<5	2.1 mmol/ L	1.9 mmol/L	10.00%	ALIVE

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DEPARTMENT

NASIR A BEGU M	2503143 13963	47	FEMA LE	BREATHLESS NESS	CK D LEP TOS PIR OSI S	16 0 m m Hg	11 0 m m Hg	160/ 110 mm Hg	94%	23 min ⁻¹	134 mg/d L	98.6 °F	118 BP M	151 mg/dL	5.0 mg/d L	231 mg/ L	2.8 mmol/ L	1.9 mmol/L	32.00%	ALIVE
MOHA MMAD ISMAI L	2412312 87687	69	MALE	AFI DISORIENTE D	CK D T2D M CA D	15 0 m m Hg	80 m m Hg	150/ 80 mm Hg	94%	20 min ⁻¹	94 mg/d L	97.9 °F	64 BP M	129 mg/dL	5.0 mg/d L	192 mg/ L	1.7 mmol/ L	1.2 mmol/L	29.00%	ALIVE
ELUM ALAI	2412302 87659	74	MALE	CHEST PAIN	CK D T2D M SHT N	13 0 m m Hg	80 m m Hg	130/ 80 mm Hg	100%	22 min ⁻¹	124 mg/d L	97.4 °F	74 BP M	111 mg/dL	4.0 mg/d L	10 mg/ L	1.6 mmol/ L	1.4 mmol/L	13.00%	ALIVE
DHAN A BAKKI YAM	2412202 84534	79	FEMA LE	GIDDINESS	CK D T2D M SHT N	20 0 m m Hg	10 0 m m Hg	200/ 100 mm Hg	97%	24 min ⁻¹	81 mg/d L	96.6 °F	68 BP M	103 mg/dL	6.0 mg/d L	6 mg/ L	1.4 mmol/ L	0.9 mmol/L	36.00%	ALIVE
RAMC HAND RA RAUT	2412152 82950	64	MALE	SCROTAL SWELLING	CK D T2D M SHT N	14 0 m m Hg	90 m m Hg	140/ 90 mm Hg	99%	22 min ⁻¹	HIG H	98.1 °F	80 BP M	97 mg/dL	3.0 mg/d L	431 mg/ L	4.6 mmol/ L	7.2 mmol/L	5.60%	DEAD
NAGA RAJ VEMP ULI	2412182 83990	46	MALE	BREATHLESS NESS	CK D DC LD	18 0 m	11 0 m	180/ 110 mm Hg	91%	30 min ⁻¹	130 mg/d L	97.8 °F	94 BP M	103 mg/dL	7.0 mg/d L	32 mg/ L	1.2 mmol/ L	0.7 mmol/L	41.67%	ALIVE

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

					SHT N	m Hg	m Hg													
GIRIB ABU	2412162 83391	51	MALE	CHEST PAIN	CK D T2D M SHT N	15 0 m m Hg	10 0 m m Hg	150/ 100 mm Hg	99%	22 min ⁻¹	125 mg/d L	98.2 °F	63 BP M	64 mg/dL	4.6 mg/d L	124 mg/ L	1.4 mmol/ L	1.1 mmol/L	20.29%	ALIVE
AYYAS WAMY	2412062 79973	74	MALE	DIALYSIS	CK D T2D M CL D	18 0 m m Hg	10 0 m m Hg	180/ 100 mm Hg	98%	21 min ⁻¹	140 mg/d L	98.8 °F	97 BP M	105 mg/dL	4.4 mg/d L	76 mg/ L	7.4 mmol/ L	9.3 mmol/L	-25.68 %	DEAD
MALLI GA	2412072 80316	54	FEMA LE	BREATHLESS NESS	CK D T2D M SHT N	20 0 m m Hg	10 0 m m Hg	200/ 100 mm Hg	96%	21 min ⁻¹	82 mg/d L	97.6 °F	95 BP M	49 mg/dL	2.3 mg/d L	<5 mg/ L	4.8 mmol/ L	2.2 mmol/L	54.17%	ALIVE
RAJAS EKAR	2412102 81753	55	MALE	CHEST PAIN	CK D T2D M CA D	13 0 m m Hg	80 m m Hg	130/ 80 mm Hg	98%	24 min ⁻¹	270 mg/d L	98.2 °F	97 BP M	73 mg/dL	3.9 mg/d L	<5 mg/ L	1.3 mmol/ L	0.9 mmol/L	29.69%	ALIVE
MAHB OOB BASH A	2412072 80364	71	MALE	BREATHLESS NESS	CK D T2D M	12 0 m m Hg	70 m m Hg	120/ 70 mm Hg	68%	20 min ⁻¹	155 mg/d L	97.1 °F	96 BP M	120 mg/dL	5.4 mg/d L	66 mg/ L	1.3 mmol/ L	2.7 mmol/L	-103.01 %	DEAD
SUBR AMAN I	2411282 77787	77	MALE	BREATHLESS NESS	CK D T2D	18 0 m	70 m	180/ 70	91%	26 min ⁻¹	155 mg/d L	97.2 °F	110 BP M	160 mg/dL	7.3 mg/d L	55 mg/ L	1.6 mmol/ L	1.3 mmol/L	18.75%	ALIVE

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY
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NEEL AKAN DAN				ABDOMINAL PAIN	M CA D	m Hg	m Hg	mm Hg												
ARUM UGAM	2411272 77450	60	MALE	GIDDINESS	CK D T2D M	15 0 m m Hg	10 0 m m Hg	150/ 100 mm Hg	100%	22 min ⁻¹	54 mg/d L	98.0 °F	100 BP M	67 mg/dL	3.0 mg/d L	24 mg/ L	2.5 mmol/ L	1.8 mmol/L	28.00%	ALIVE
THANI GAIM ALAI	2411252 76635	47	MALE	ALTERED SENSORIUM	CK D T2D M	14 0 m m Hg	90 m m Hg	140/ 90 mm Hg	97%	14 min ⁻¹	303 mg/d L	98.1 °F	82 BP M	146 mg/dL	7.3 mg/d L	222 mg/ L	2.4 mmol/ L	1.2 mmol/L	50.00%	ALIVE
RAME SH	2411172 73480	52	MALE	VOMITING GIDDINESS	DC LD CK D T2D M	12 0 m m Hg	80 m m Hg	120/ 80 mm Hg	100%	22 min ⁻¹	168 mg/d L	97.9 °F	91 BP M	135 mg/dL	3.2 mg/d L	13 mg/ L	7.7 mmol/ L	2.5 mmol/L	67.53%	ALIVE
RAMA CHAN DRA RAJU	2410072 59458	67	MALE	DECREASED URINE OUTPUT	CK D APE SHT N	14 0 m m Hg	10 0 m m Hg	140/ 100 mm Hg	80%	24 min ⁻¹	77 mg/d L	99.6 °F	100 BP M	230 mg/dL	9.9 mg/d L	238 mg/ L	4.3 mmol/ L	6.4 mmol/L	4.80%	DEAD
PERU MAL RAJI	2410132 61039	64	MALE	BREATHLESS NESS COUGH	CK D SHT N T2D M CA D	15 0 m m Hg	10 0 m m Hg	150/ 100 mm Hg	85%	24 min ⁻¹	134 mg/d L	98.1 °F	93 BP M	35 mg/dL	2.3 mg/d L	<5 mg/ L	2.1 mmol/ L	0.7 mmol/L	66.67%	ALIVE

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY
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SHAN MUGA N SUND ARAM	2411092 69609	59	MALE	BREATHLESS NESS	CK D SHT N	17 0 m m Hg	10 0 m m Hg	170/ 100 mm Hg	98%	24 min ⁻¹	111 mg/d L	98.0 °F	72 BP M	83 mg/dL	4.5 mg/d L	<5 mg/ L	1.9 mmol/ L	1.2 mmol/L	36.84%	ALIVE
NAGA RATHI NAM MUNU SWAM Y	2408122 34251	63	MALE	GIDDINESS	CK D	11 0 m m Hg	60 m m Hg	110/ 60 mm Hg	98%	22 min ⁻¹	191 mg/d L	96.7 °F	112 BP M	39 mg/dL	4.0 mg/d L	34 mg/ L	3.7 mmol/ L	0.8 mmol/L	78.32%	ALIVE
VINAY AGI	2410152 61664	56	FEMA LE	BREATHLESS NESS	CK D SHT N T2D M SEI ZU RE DIS OR DE R	14 0 m m Hg	70 m m Hg	140/ 70 mm Hg	65%	34 min ⁻¹	217 mg/d L	97.4 °F	108 BP M	76 mg/dL	2.8 mg/d L	12 mg/ L	1.7 mmol/ L	1.0 mmol/L	41.18%	ALIVE
KAMS ALA	2410022 57755	74	FEMA LE	BREATHLESS NESS FACE PUFFINESS	CK D CA D T2D M APE	11 0 m m Hg	60 m m Hg	110/ 60 mm Hg	84%	23 min ⁻¹	304 mg/d L	96.2 °F	54 BP M	57 mg/dL	1.8 mg/d L	<5m g/L	10.8 mmol/ L	8.7 mmol/L	19.91%	ALIVE
SANT HOSH KUMA R	2409222 52824	28	MALE	FEVER	CE RE BR AL	80 m m Hg	60 m m Hg	80/6 0 mm Hg	85%	45 min ⁻¹	86 mg/d L	98.1 °F	140 BP M	114 mg/dL	3.8 mg/d L	334 mg/ L	2.1 mmol/ L	4.5 mmol/L	1.43%	ALIVE

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY
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					PAL SY CK D APE															
KAST HURI	2310281 45682	70	FEMA LE	FEVER VOMITING LOOSE STOOLS	CK D SHT N HY POT HY ROI DIS M HEP AT OM EG AL Y	80 m m Hg	50 m m Hg	80/5 0 mm Hg	98%	24 min ⁻¹	104 mg/d L	97.2 °F	98 BP M	98 mg/dL	3.5 mg/d L	420 mg/ L	1.7 mmol/ L	4.6 mmol/L	-26.80 %	DEAD
NAGA MMAL	2409112 45108	46	FEMA LE	GIDDINESS VOMITING	T2D M SHT N DY SLI PID EMI A	18 0 m m Hg	11 0 m m Hg	180/ 110 mm Hg	93%	22 min ⁻¹	182 mg/d L	99.0 °F	102 BP M	212 mg/dL	17.2 mg/d L	33 mg/ L	1.8 mmol/ L	1.2 mmol/L	34.78%	ALIVE
LOGA NATH AN	2409112 45091	45	MALE	FEVER DECREASED URINE OUTPUT	CA D SHT N	15 0 m m Hg	80 m m Hg	150/ 80 mm Hg	100%	33 min ⁻¹	155 mg/d L	99.3 °F	133 BP M	170 mg/dL	12.2 mg/d L	397 mg/ L	2.5 mmol/ L	2.1 mmol/L	52.00%	ALIVE

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY
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PAARI	2409112 44840	59	MALE	B/L LIMB WEAKNESS SWELLING	DM CK D SHT N	15 0 m m Hg	90 m m Hg	150/ 90 mm Hg	93%	25 min ⁻¹	508 mg/d L	97.2 °F	57 BP M	44 mg/dL	2.0 mg/d L	22 mg/ L	2.7 mmol/ L	0.9 mmol/L	66.67%	ALIVE
KUPPA N	2312241 62427	63	MALE	B/L UPPER LIMB WEAKNESS	CK D SHT N CV A	15 0 m m Hg	10 0 m m Hg	150/ 100 mm Hg	100%	20 min ⁻¹	152 mg/d L	97.6 °F	60 BP M	250 mg/dL	5.9 mg/d L	86 mg/ L	2.1 mmol/ L	3.4 mmol/L	-61.90 %	DEAD
VIJAY ALAK SHMI	2409072 42701	73	FEMA LE	CHEST PAIN BREATHLESS NESS	T2D M SHT N CA D CK D	18 0 m m Hg	12 0 m m Hg	180/ 120 mm Hg	85%	30 min ⁻¹	340 mg/d L	98.6 °F	122 BP M	54 mg/dL	2.0 mg/d L	22 mg/ L	4.3 mmol/ L	2.0 mmol/L	53.49%	ALIVE
GOPAL NAYA KAR KAMA RAJAN	2409042 41576	64	MALE	GIDDINESS VOMITING	CA D SHT N T2D M	17 0 m m Hg	90 m m Hg	170/ 90 mm Hg	86%	24 min ⁻¹	182 mg/d L	98.0 °F	88 BP M	63 mg/dL	2.5 mg/d L	45 mg/ L	3.7 mmol/ L	2.9 mmol/L	21.62%	ALIVE
SAYEE RA BEGU M	2408312 40468	66	FEMA LE	BREATHLESS NESS	T2D M SHT N CK D	16 0 m m Hg	10 0 m m Hg	160/ 100 mm Hg	90%	23 min ⁻¹	226 mg/d L	97.3 °F	101 BP M	131 mg/dL	7.6 mg/d L	15 mg/ L	1.5 mmol/ L	0.8 mmol/L	45.58%	ALIVE
AJAYA KUMA R	2310282 45360	55	MALE	ABDOMINAL DISTENSION VOMITING	CK D DC LD	12 0 m m	90 m m Hg	120/ 90 mm Hg	100%	33 min ⁻¹	236 mg/d L	98.1 °F	86 BP M	126 mg/dL	2.4 mg/d L	70 mg/ L	2.1 mmol/ L	5.2 mmol/L	-147.62 %	DEAD

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY
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YADAVA					SHT N T2D M	m Hg														
MAHENTHRAN	2408312 40184	53	FEMALE	GIDDINESS VOMITING	CK D CA D SHT N T2D M HF	16 0 m m Hg	10 0 m m Hg	160/ 100 mm Hg	96%	18 min ⁻¹	375 mg/d L	98.4 °F	92 BP M	41 mg/dL	1.5 mg/d L	77 mg/ L	3.8 mmol/ L	2.1 mmol/L	44.74%	ALIVE
RAVI	2408292 39629	57	MALE	BREATHLESS NESS	DM SHT N CK D CA D	16 0 m m Hg	11 0 m m Hg	160/ 110 mm Hg	84%	22 min ⁻¹	228 mg/d L	98.2 °F	120 BP M	56 mg/dL	2.9 mg/d L	299 mg/ L	0.8 mmol/ L	0.4 mmol/L	50.00%	ALIVE
LALITHA	2408132 34351	64	FEMALE	DECREASED URINE OUTPUT BREATHLESS NESS	CK D	16 0 m m Hg	80 m m Hg	160/ 80 mm Hg	100%	24 min ⁻¹	98 mg/d L	98.4 °F	98 BP M	84 mg/dL	9.6 mg/d L	27 mg/ L	9.2 mmol/ L	7.2 mmol/L	21.74%	ALIVE
MALLIGANATHAN	2408092 33063	67	FEMALE	BREATHLESS NESS	CA D CK D T2D M SHT N CA BR	14 0 m m Hg	10 0 m m Hg	140/ 100 mm Hg	82%	27 min ⁻¹	306 mg/d L	97.6 °F	84 BP M	88 mg/dL	2.9 mg/d L	35 mg/ L	2.4 mmol/ L	1.3 mmol/L	42.98%	ALIVE

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

					EAS T															
JAYAN THI SLEVA RAJ	2408072 32656	58	FEMA LE	BREATHLESS NESS	T2D M SHT N HY POT HY ROI DIS M	14 0 m m Hg	80 m m Hg	140/ 80 mm Hg	85%	27 min ⁻¹	245 mg/d L	97.5 °F	112 BP M	72 mg/dL	4.3 mg/d L	348 mg/ L	4.3 mmol/ L	2.6 mmol/L	39.53%	ALIVE
SALO MI	2407272 29194	52	FEMA LE	BREATHLESS NESS	CK D SHT N T2D M	22 0 m m Hg	12 0 m m Hg	220/ 120 mm Hg	98%	21 min ⁻¹	98 mg/d L	98.4 °F	102 BP M	103 mg/dL	8.7 mg/d L	112 mg/ L	2.2 mmol/ L	1.3 mmol/L	40.91%	ALIVE
DURG ADEVI	2407252 28636	54	FEMA LE	BREATHLESS NESS GIDDINESS	CK D T2D M HY POT HY ROI DIS M AN EMI A	15 0 m m Hg	90 m m Hg	150/ 90 mm Hg	90%	24 min ⁻¹	259 mg/d L	97.6 °F	88 BP M	138 mg/dL	9.2 mg/d L	135 mg/ L	2.3 mmol/ L	1.0 mmol/L	57.39%	ALIVE
ARJUN	2407202 26954	30	MALE	COUGH BREATHLESS NESS VOMITING	T2D M SHT N	21 0 m	11 0 m	210/ 110 mm Hg	75%	32 min ⁻¹	151 mg/d L	96.8 °F	100 BP M	197 mg/dL	15.2 mg/d L	39 mg/ L	2.5 mmol/ L	2.0 mmol/L	20.00%	ALIVE

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

						m Hg	m Hg													
MEEN ATCHI	2407142 24929	74	FEMA LE	BREATHLESS NESS	CK D SHT N T2D M	12 0 m m Hg	80 m m Hg	120/ 80 mm Hg	64%	30 min ⁻¹	125 mg/d L	98.2 °F	62 BP M	100 mg/dL	9.5 mg/d L	8 mg/ L	19.0 mmol/ L	20.0 mmol/L	5.55%	DEAD
ANHA LATCH I NAGA PPAN	2407052 22222	59	FEMA LE	ABDOMINAL PAIN VOMITING	T2D M SHT N CK D	10 0 m m Hg	60 m m Hg	100/ 60 mm Hg	95%	20 min ⁻¹	299 mg/d L	98.0 °F	80 BP M	53 mg/dL	2.3 mg/d L	178 mg/ L	1.8 mmol/ L	1.4 mmol/L	23.08%	ALIVE
PUSHP A	2407092 23296	63	FEMA LE	BREATHLESS NESS	T2D M SHT N CK D CA D	20 0 m m Hg	12 0 m m Hg	200/ 120 mm Hg	95%	28 min ⁻¹	234 mg/d L	98.6 °F	114 BP M	123 mg/dL	5.2 mg/d L	16 mg/ L	0.9 mmol/ L	0.8 mmol/L	11.11%	ALIVE
HASIN A	2407042 21852	69	FEMA LE	LEG SWELLING BREATHLESS NESS	T2D M SHT N	15 0 m m Hg	70 m m Hg	150/ 70 mm Hg	83%	26 min ⁻¹	164 mg/d L	98.6 °F	82 BP M	82 mg/dL	2.6 mg/d L	17 mg/ L	1.1 mmol/ L	0.9 mmol/L	18.18%	ALIVE
GLAD YS JOSEP H	2407032 21437	83	FEMA LE	LETHARGY DECREASED RESPONSE	CA D CK D SHT N HY POT	18 0 m m Hg	10 0 m m Hg	180/ 100 mm Hg	99%	20 min ⁻¹	49 mg/d L	98.2 °F	80 BP M	166 mg/dL	6.8 mg/d L	61 mg/ L	1.2 mmol/ L	0.8 mmol/L	31.62%	ALIVE

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY
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VARD HARAJ AN	2406012 11772	58	MALE	FALL FROM BED	CA D SHT N PAR KIN SO NS DIS EAS E	80 m m Hg	60 m m Hg	80/60 mm Hg	99%	36 min ⁻¹	158 mg/d L	101.5 °F	105 BP M	111 mg/dL	3.0 mg/d L	8 mg/ L	1.3 mmol/ L	2.3 mmol/L	7.60%	DEAD	
PARA MESH WARA N	2405312 11348	77	MALE	NUMBNESS B/L UPPER LOWER LIMB	CK D SHT N T2D M CA D	150 m m Hg	100 m m Hg	150/100 mm Hg	98%	24 min ⁻¹	174 mg/d L	97.4 °F	94 BP M	84 mg/dL	2.5 mg/d L	25 mg/ L	3.8 mmol/ L	2.1 mmol/L	44.88%	ALIVE	
GANE SAN	2405282 10216	64	MALE	BREATHLESS NESS	T2D M SHT N CK D	160 m m Hg	90 m m Hg	160/90 mm Hg	93%	30 min ⁻¹	119 mg/d L	97.5 °F	95 BP M	74 mg/dL	5.6 mg/d L	24 mg/ L	1.6 mmol/ L	1.4 mmol/L	12.50%	ALIVE	
NATA RAJAN	2308071 17024	56	MALE	NECK SWELLING	CK D TB	140 m	90 m	140/90	99%	20 min ⁻¹	380 mg/d L	99.3 °F	112 BP M	211 mg/dL	3.4 mg/d L	112 mg/ L	1.4 mmol/ L	1.6 mmol/L	-14.29 %	DEAD	

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY
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					SKT N CA D	m Hg	m Hg	mm Hg												
SARA LADE VI	2505053 31418	47	FEMA LE	BREATHLESS NESS	TH YR OID SHT N CK D	10 0 m m Hg	80 m m Hg	100/ 80 mm Hg	99%	24 min ⁻¹	143 mg/d L	98.2 °F	143 BP M	54 mg/dL	0.8 mg/d L	38 mg/ L	13.1 mmol/ L	1.5 mmol/L	88.55%	ALIVE
MUNU SWAM Y	2505013 30250	58	MALE	BREATHLESS NESS	SHT N CK D CA D	16 0 m m Hg	60 m m Hg	160/ 60 mm Hg	100%	24 min ⁻¹	148 mg/d L	97.6 °F	93 BP M	339 mg/dL	26.7 mg/d L	232 mg/ L	0.8 mmol/ L	0.6 mmol/L	25.00%	ALIVE
GUBE NDIRA N	2407182 26372	58	MALE	BREATHLESS NESS	SHT N CK D CA D	12 0 m m Hg	80 m m Hg	120/ 80 mm Hg	98%	26 min ⁻¹	134 mg/d L	97.1 °F	78 BP M	193 mg/dL	16.3 mg/d L	30 mg/ L	8.1 mmol/ L	1.2 mmol/L	85.19%	ALIVE
PUNIT HA SAMB ATH	2308231 21809	61	FEMA LE	GENERALISE D FATIGUE	SHT N T2D M HF HY POT HY ROI DIS M APE	13 0 m m Hg	90 m m Hg	130/ 90 mm Hg	99%	20 min ⁻¹	190 mg/d L	96.5 °F	84 BP M	143 mg/dL	4.7 mg/d L	23 mg/ L	2.2 mmol/ L	2.5 mmol/L	-13.64 %	DEAD

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY
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MAAR THAL	2505013 30270	55	FEMA LE	BREATHLESS NESS FEVER	SHT N CK D CA D	13 0 m m Hg	70 m m Hg	130/ 70 mm Hg	99%	22 min ⁻¹	140 mg/d L	97.1 °F	98 BP M	66 mg/dL	2.6 mg/d L	22 mg/ L	8.5 mmol/ L	6.3 mmol/L	25.88%	ALIVE
KASI	2505173 35421	65	FEMA LE	BREATHLESS NESS PEDEAL EDEMA	SHT N CK D APE	11 0 m m Hg	70 m m Hg	110/ 70 mm Hg	100%	24 min ⁻¹	151 mg/d L	97.2 °F	60 BP M	148 mg/dL	2.9 mg/d L	35 mg/ L	7.8 mmol/ L	1.1 mmol/L	85.90%	ALIVE
PRASA NTH	2412092 81243	26	MALE	BREATHLESS NESS	SHT N CK D	11 0 m m Hg	70 m m Hg	110/ 70 mm Hg	98%	32 min ⁻¹	125 mg/d L	98.1 °F	80 BP M	119 mg/dL	8.5 mg/d L	120 mg/ L	1.5 mmol/ L	1.1 mmol/L	26.67%	ALIVE
KAST HURI	2505043 31017	49	FEMA LE	BREATHLESS NESS CHEST PAIN	SHT N T2D M CK D	13 0 m m Hg	80 m m Hg	130/ 80 mm Hg	98%	22 min ⁻¹	201 mg/d L	97.4 °F	88 BP M	107 mg/dL	6.7 mg/d L	19 mg/ L	1.7 mmol/ L	1.2 mmol/L	29.82%	ALIVE
PROM ODHA KUMA RI	2505193 35853	70	FEMA LE	BREATHLESS NESS FEVER	SHT N T2D M CK D	14 0 m m Hg	80 m m Hg	140/ 80 mm Hg	89%	26 min ⁻¹	152 mg/d L	99.4 °F	78 BP M	90 mg/dL	3.8 mg/d L	345 mg/ L	2.3 mmol/ L	1.4 mmol/L	39.13%	ALIVE
KARU NAKA RAN	2210105 060	70	MALE	BREATHLESS NESS	SHT N T2D M CA D	15 0 m m Hg	80 m m Hg	150/ 80 mm Hg	85%	27 min ⁻¹	186 mg/d L	98.3 °F	90 BP M	288 mg/dL	3.8 mg/d L	248 mg/ L	2.2 mmol/ L	4.1 mmol/L	8.90%	DEAD

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY
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GUNA	2210281 3258	57	MALE	BREATHLESS NESS FEVER	SHT N CK D	18 0 m m Hg	10 0 m m Hg	180/ 100 mm Hg	83%	40 min ⁻¹	151 mg/d L	102.0 °F	151 BP M	102 mg/dL	4.3 mg/d L	323 mg/ L	3.2 mmol/ L	4.1 mmol/L	5.20%	DEAD
RUKU MANI	2211111 9149	68	FEMA LE	BREATHLESS NESS FEVER	SHT N T2D M	11 0 m m Hg	60 m m Hg	110/ 60 mm Hg	100%	19 min ⁻¹	267 mg/d L	99.3 °F	70 BP M	138 mg/dL	2.5 mg/d L	224 mg/ L	1.6 mmol/ L	2.5 mmol/L	5.60%	DEAD
MAYA NBAT HBEE ALIYA R	2211152 0325	62	FEMA LE	BREATHLESS NESS CHEST PAIN	SHT N T2D M PE CK D CA D	16 0 m m Hg	90 m m Hg	160/ 90 mm Hg	82%	28 min ⁻¹	261 mg/d L	96.2 °F	102 BP M	144 mg/dL	7.7 mg/d L	11 mg/ L	2.1 mmol/ L	3.2 mmol/L	-52.38 %	DEAD
KART HICK	2211152 0562	32	MALE	B/L LIMB WEAKNESS SWELLING	T2D M CK D IDA SHT N	17 0 m m Hg	10 0 m m Hg	170/ 100 mm Hg	97%	22 min ⁻¹	172 mg/d L	100.1 °F	123 BP M	57 mg/dL	2.0 mg/d L	34 mg/ L	3.2 mmol/ L	2.1 mmol/L	34.38%	ALIVE
ANNA MALA I GOVID AN	2303126 7567	54	MALE	LOOSE STOOLS ABDOMINAL PAIN	T2D M HY POT HY ROI D CK D	20 0 m m Hg	11 0 m m Hg	200/ 110 mm Hg	100%	26 min ⁻¹	60 mg/d L	97.2 °F	54 BP M	200 mg/dL	5.7 mg/d L	<5 mg/ L	3.2 mmol/ L	3.5 mmol/L	9.21	DEAD

A COMPARATIVE STUDY OF CRP, BASELINE LACTATE, AND 6-HOUR LACTATE CLEARANCE IN CHRONIC KIDNEY DISEASE PATIENTS IN EMERGENCY DEPARTMENT

MUTHUKUMAR	22122737627	54	MALE	BREATHLESS NESS FOOT ULCER	SHT N CK D	14 0 m m Hg	70 m m Hg	140/ 70 mm Hg	98%	22 min ⁻¹	231 mg/d L	98.3 °F	90 BP M	102 mg/dL	9.4 mg/d L	42 mg/ L	6.5 mmol/ L	7.5 mmol/L	-15.38 %	DEAD
RAJENDHIRAN	231121152560	66	MALE	SCROTAL SWELLING	SHT N CK D T2D M	17 0 m m Hg	11 0 m m Hg	170/ 110 mm Hg	100%	19 min ⁻¹	506 mg/d L	98.2 °F	116 BP M	179 mg/dL	6.2 mg/d L	238 mg/ L	2.1 mmol/ L	3.4 mmol/L	-61.90 %	DEAD
SUBRAMANIAM PONNUSWAMY	22122737683	71	MALE	BREATHLESS NESS	SHT N T2D M CK D CA D	18 0 m m Hg	90 m m Hg	180/ 90 mm Hg	97%	22 min ⁻¹	251 mg/d L	97.7 °F	120 BP M	100 mg/dL	2.4 mg/d L	86 mg/ L	1.2 mmol/ L	3.5 mmol/L	-191.67 %	DEAD
ANTHONYA MMAL	22122938233	73	FEMALE	VOMITING SLURRING OF SPEECH	CA BR EAS T SHT N T2D M AN EMI A	12 0 m m Hg	80 m m Hg	120/ 80 mm Hg	99%	18 min ⁻¹	53 mg/d L	97.4 °F	98 BP M	69 mg/dL	2.2 mg/d L	224 mg/ L	1.1 mmol/ L	1.6 mmol/L	-45.45 %	DEAD
KABILAN	22123038771	22	MALE	BREATHLESS NESS PEDEAL EDEMA	SHT N CK D	14 0 m m Hg	80 m m Hg	140/ 80 mm Hg	100%	23 min ⁻¹	102 mg/d L	95.2 °F	84 BP M	54 mg/dL	2.5 mg/d L	53 mg/ L	1.2 mmol/ L	2.3 mmol/L	9.10%	DEAD

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PERU MAL SUBR AMAN I	2401051 66005	50	MALE	B/L LOWER LIMB SWELLING	T2D M SHT N CK D	15 0 m m Hg	90 m m Hg	150/ 90 mm Hg	76%	30 min ⁻¹	409 mg/d L	100.0 °F	114 BP M	109 mg/dL	8.5 mg/d L	221 mg/ L	1.9 mmol/ L	1.4 mmol/L	26.32%	ALIVE
NAGA RAJAN	2401271 71953	43	MALE	BREATHLESS NESS	T2D M CK D SHT N HF	13 0 m m Hg	80 m m Hg	130/ 80 mm Hg	100%	22 min ⁻¹	324 mg/d L	97.5 °F	76 BP M	107 mg/dL	7.8 mg/d L	60 mg/ L	0.7 mmol/ L	1.2 mmol/L	7.14%	DEAD
KANT HAL AMMA L	2401291 72139	63	FEMA LE	LOOSE STOOLS	CK D DM SHT N CA D	14 0 m m Hg	80 m m Hg	140/ 80 mm Hg	100%	24 min ⁻¹	40 mg/d L	98.2 °F	94 BP M	74 mg/dL	3.5 mg/d L	231 mg/ L	2.4 mmol/ L	1.7 mmol/L	29.17%	ALIVE
DHAN ALAK SHMI	2211011 4624	58	FEMA LE	ABDOMINAL PAIN	T2D M CK D	10 0 m m Hg	80 m m Hg	100/ 80 mm Hg	98%	24 min ⁻¹	444 mg/d L	98.6 °F	84 BP M	93 mg/dL	3.5 mg/d L	33 mg/ L	2.4 mmol/ L	1.0 mmol/L	58.33%	ALIVE
DHAN RAJ	2211061 6626	63	MALE	BREATHLESS NESS	T2D M CK D SHT N CA D PE	17 0 m m Hg	80 m m Hg	170/ 80 mm Hg	66%	28 min ⁻¹	150 mg/d L	98.2 °F	80 BP M	86 mg/dL	6.2 mg/d L	89 mg/ L	0.9 mmol/ L	0.8 mmol/L	11.11%	ALIVE

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ABDUL KAREEM	2211222 3927	57	MALE	DECREASED APPETITE	CK D SHT N CA D T2D M	10 0 m m Hg	80 m m Hg	100/ 80 mm Hg	100%	38 min ⁻¹	170 mg/d L	101.4 °F	115 BP M	128 mg/dL	4.6 mg/d L	289 mg/ L	5.3 mmol/ L	2.1 mmol/L	60.38%	ALIVE
MAQB OOL KHAD AR	2301194 5838	67	MALE	HEMATOCHE ZIA	CA D CK D SHT N	13 0 m m Hg	70 m m Hg	130/ 70 mm Hg	100%	22 min ⁻¹	103 mg/d L	98.3 °F	66 BP M	105 mg/dL	3.7 mg/d L	186 mg/ L	1.3 mmol/ L	2.0 mmol/L	-53.85 %	DEAD
DEVA KI HARIK RISHN AN	2305098 5837	68	FEMA LE	BREATHLESS NESS	CK D APE SHT N T2D M	20 0 m m Hg	90 m m Hg	200/ 90 mm Hg	85%	30 min ⁻¹	152 mg/d L	98.6 °F	83 BP M	34 mg/dL	5.7 mg/d L	12 mg/ L	1.2 mmol/ L	2.1 mmol/L	-75.00 %	DEAD
SANK AR GOPAL	2301214 6816	60	MALE	FEVER	T2D M SHT N CK D	16 0 m m Hg	80 m m Hg	160/ 80 mm Hg	89%	20 min ⁻¹	118 mg/d L	100.9 °F	102 BP M	64 mg/dL	9.1 mg/d L	53 mg/ L	1.4 mmol/ L	0.8 mmol/L	42.86%	ALIVE
VASA NTHA THIRU VENG ADAM	2302085 575	53	FEMA LE	CHEST PAIN	CK D APE SHT N CA D	17 0 m m Hg	90 m m Hg	170/ 90 mm Hg	87%	22 min ⁻¹	243 mg/d L	98.2 °F	90 BP M	114 mg/dL	7.1 mg/d L	231 mg/ L	3.1 mmol/ L	2.4 mmol/L	22.58%	ALIVE

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RAMA NI BAI PARTH ASAR ATHY	2302155 8308	65	FEMA LE	ABDOMINAL PAIN	SHT N T2D M CK D CA D	15 0 m m Hg	80 m m Hg	150/ 80 mm Hg	100%	21 min ⁻¹	227 mg/d L	96.0 °F	130 BP M	87 mg/dL	6.8 mg/d L	102 mg/ L	3.2 mmol/ L	3.4 mmol/L	6.25%	DEAD
VIJAY ALAK SHMI	2303046 4465	55	FEMA LE	GIDDINESS VOMITING	T2D M SHT N	18 0 m m Hg	70 m m Hg	180/ 70 mm Hg	98%	19 min ⁻¹	230 mg/d L	97.3 °F	98 BP M	71 mg/dL	6.9 mg/d L	197 mg/ L	1.6 mmol/ L	2.5 mmol/L	-56.25 %	DEAD
SAMB HU KUMA R	2303076 5490	29	MALE	FEVER BREATHLESS NESS	SHT N CK D	90 m m Hg	60 m m Hg	90/6 0 mm Hg	88%	36 min ⁻¹	165 mg/d L	97.2 °F	106 BP M	282 mg/dL	27.7 mg/d L	234 mg/ L	1.9 mmol/ L	1.0 mmol/L	47.37%	ALIVE
UMAD EVI RAME SH	2305269 2346	44	FEMA LE	ABDOMINAL PAIN CHEST PAIN	SHT N CK D T2D M	80 m m Hg	60 m m Hg	80/6 0 mm Hg	89%	29 min ⁻¹	116 mg/d L	97.0 °F	114 BP M	151 mg/dL	7.5 mg/d L	255 mg/ L	2.5 mmol/ L	3.1 mmol/L	2.40%	DEAD
SASID HARA N	2306149 8911	70	MALE	CHEST PAIN BREATHLESS NESS	CK D SHT N AC S	18 0 m m Hg	11 0 m m Hg	180/ 110 mm Hg	96%	18 min ⁻¹	132 mg/d L	97.2 °F	86 BP M	102 mg/dL	9.9 mg/d L	102 mg/ L	1.3 mmol/ L	2.3 mmol/L	-76.92 %	DEAD
MURU GAN V	2307101 07371	60	MALE	BREATHLESS NESS	CK D SHT N	14 0 m m Hg	70 m m Hg	140/ 70 mm Hg	89%	24 min ⁻¹	133 mg/d L	97.6 °F	90 BP M	203 mg/dL	12.9 mg/d L	285 mg/ L	1.4 mmol/ L	2.4 mmol/L	-71.43 %	DEAD

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SARA VANA N	2308181 20368	51	MALE	SLIP AND FALL BACK PAIN	CK D CA D T2D M SHT N	13 0 m m Hg	90 m m Hg	130/ 90 mm Hg	99%	20 min ⁻¹	167 mg/d L	98.1 °F	88 BP M	121 mg/dL	7.7 mg/d L	84 mg/ L	3.1 mmol/ L	4.5 mmol/L	-45.16 %	DEAD
RAJAA MMAL	2308251 22789	80	FEMA LE	BACK PAIN LOSS OF APPETITE	CK D SHT N	10 0 m m Hg	60 m m Hg	100/ 60 mm Hg	97%	20 min ⁻¹	102 mg/d L	97.0 °F	99 BP M	57 mg/dL	1.7 mg/d L	56 mg/ L	1.7 mmol/ L	2.4 mmol/L	8.60%	DEAD
SUBBI RAMA NI	2309101 27920	58	MALE	BREATHLESS NESS	CK D T2D M SHT N APE	12 0 m m Hg	80 m m Hg	120/ 80 mm Hg	98%	22 min ⁻¹	200 mg/d L	98.2 °F	104 BP M	345 mg/dL	16.6 mg/d L	83 mg/ L	1.4 mmol/ L	1.6 mmol/L	-14.29 %	DEAD
THIRU VENK ADAM	2310514 0916	52	MALE	DECREASED URINE OUTPUT BREATHLESS NESS	CK D SHT N T2D M CA D	N R	N R	NR/ NR mm Hg	78%	38 min ⁻¹	247 mg/d L	96.7 °F	88 BP M	107 mg/dL	3.7 mg/d L	142 mg/ L	3.2 mmol/ L	4.5 mmol/L	-40.63 %	DEAD