"COMBINATION OF REVERSE SHOCK INDEX AND GLASGOW COMA SCALE TO INITIATE MASSIVE TRANSFUSION PROTOCOL IN TRAUMA PATIENTS."

By

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P.G in EMERGENCY MEDICINE

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LIST OF ABBREVIATIONS USED

MTP	Massive Transfusion Protocols
TASH	Trauma-Associated Severe Haemorrhage
ABC	Assessment Blood Consumption
FAST	Focused Assessment With Sonography For Trauma
SI	Shock Index
SBP	Systolic Blood Pressure
DBP	Diastolic Blood Pressure
HR	Heart Rate
GCS	Glasgow Coma Scale
rSI	Reverse Shock Index
rSIG	Reverse Shock Index * Glasgow Coma Scale
FASILA	Focused Assessment With Sonography In Trauma, Shock Index And Initial Serum Lactate
T-RTS	Triage Revised Trauma Score
PSP	Previous Simple Prediction
ISS	Injury Severity Score
SIA	Shock Index*Age
MT	Massive Transfusion
qSOFA	Quick Sequential Organ Failure Assessment
ROC	Reciever Operating Characteristics

LIST OF TABLES

ABSTRACT

Background and goal: The reverse shock index multiplied by the Glasgow Coma Scale score (rSIG) predicts trauma patient mortality, according to previous studies. It is unclear if rSIG can predict massive transfusion (MT) in trauma patients. This study examines whether rSIG predicts MT in trauma patients. The study also tests whether rSIG can predict trauma patients' coagulopathy, in-hospital mortality, and 24-hour death, rSIG's prognostic value for MT in trauma patients is compared to TASH and ABC Scores.

Methods: This single-center prospective observational study at B.L.D.E.(DU), SHRI B.M. Patil medical college hospital and research centre's emergency medicine department In trauma patients, rSIG's prognostic value for MTP was compared to older scoring systems as TASH and ABC Scores.

Results: MT was given to 20 of 195 patients. MT, in-hospital mortality, 24-hour mortality, and coagulopathy are better predicted by rSIG than SI, SIA, and qSOFA. The in-hospital mortality AUROC for rSIG was 0.812, indicating its dependability. Prior study shows that rSIG can predict trauma patients' death and coagulopathy. All three tests are discriminatory, but evaluation assessment blood consumption is most accurate, followed by TASHScore and rSIG using ROC values.MT rSIG predicted better than SI, SIA, and qSOFA (AUROC = 0.842). rSIG predicted coagulopathy, in-hospital, and 24-hour mortality better than SI, SIA, and qSOFA. RSIG combines hemodynamic instability (reverse SI) and consciousness (GCS) for a more complete trauma patient evaluation. Detecting coagulopathy early with rSIG permits rewarming, acidosis correction, balanced transfusion, and massive transfusion regimens.

Conclusion: The study shows that rSIG can identify trauma patients at high risk for major transfusion, coagulopathy, and death. Assessment Blood consumption evaluation is most accurate, followed by TASH Score and rSIG, for managing severe trauma situations swiftly and effectively which could improve patient outcomes.

INTRODUCTION

Injuries rank as the leading cause of death for individuals under 40 years old and as the sixth most prevalent cause of death worldwide. The avoidable cause of death for patients with severe trauma is haemorrhage, which accounts for around half of deaths that occur within 24 hours of the trauma. [1,2] It has been demonstrated that massive transfusion protocols (MTPs) for severe bleeding enhance outcomes; still, it is critical to identify patients with enormous haemorrhage as soon as possible [3]. To predict massive transfusion (MT) in patients with severe trauma, numerous studies have been published [4,5].

Trauma-associated severe haemorrhage (TASH) Scoring methods and assessment blood consumption (ABC) are two of the very few helpful indications to anticipate the requirement for massive transfusion. These scoring systems are somewhat sophisticated, though, as they need the assessment of multiple criteria, including focused assessment with sonography for trauma (FAST), vital signs, pelvic fracture, and/or femur fracture. As a result, we must identify some practical MT indications that the emergency room may quickly and easily apply.

One tool for determining the degree of trauma in patients is the shock index (SI). It is the heart rate to systolic blood pressure ratio, first described by Allower and Burri in 1967 [6].

SI is easily collected at the patient's bedside and can assess the shock status more precisely than HR and SBP alone because it is calculated using HR and SBP readings [7-9]. SI is also useful in identifying occult shock patients. Numerous studies have shown that SI helps predict mortality and MT in trauma patients due to its simplicity and accuracy [10–13].

Hemodynamic instability, as defined by SI, often refers to a condition where the SBP is lower than the HR; it does not, however, mean that the HR is lower than the SBP. To improve this, Chung et al. created the idea of reverse shock index [14], which is derived by dividing SBP by HR, and a small rSIG value signifies that the patient's condition is critical. In contrast, the GCS, which evaluates consciousness, has been shown

to be a more reliable indicator of death in trauma patients. Reverse shock index and GCS are two straightforward but effective predictors combined to create rSIG.

They discovered that rSIG outperformed SI and SIA as a predictor of in-hospital mortality and 24-hour blood transfusion. Additionally, it has been shown in two other studies [16, 17] that rSIG is a reliable indicator of mortality in trauma patients. Although this study has limitations, Young Tark Lee et al.'s [18] recent study found that rSIG is a helpful biomarker for predicting Massive Transfusion in patients with severe trauma.

The current investigation attempts to ascertain whether rSIG can predict MT in trauma patients. It also seeks to ascertain whether rSIG can predict coagulopathy, in-hospital mortality, and 24-hour hospital mortality in trauma patients. rSIG's predictive value for MT in trauma patients is compared to earlier scoring systems, such as the trauma-associated severe haemorrhage (TASH) Scores and the assessment blood consumption (ABC) Scores.

OBJECTIVES OF THE STUDY

Primary objective:

To assess the predictive ability of rSIG to initiate Massive Transfusion protocol in trauma patients.

Secondary objective:

The secondary goal of the present study is-

1. To assess the predictive ability of rSIG for coagulopathy, in-hospital mortality and 24-h mortality in trauma patients.

2. Comparing rSIG with previous scoring systems, such as assessment blood consumption (ABC) and trauma-associated severe hemorrhage (TASH) Scores for predicting MTP in trauma patients.

REVIEW OF LITERATURE

Uemura t et al. (2024) [35] Patients with severe trauma frequently need immediate treatments that take a significant amount of time and resources to provide, such as large transfusions, resuscitation techniques, and surgery. Nevertheless, there aren't many useful indices that are simple to apply to emergency situations. The ability to readily calculate the Reverse Shock Index multiplied by the Glasgow Coma Scale [GCS] score from vital signs has made it evident in recent years that rSIG is a potential predictor of mortality. Whether rSIG is helpful for urgent interventions is unknown, though. Analysis was done on data gathered by the Japan Trauma Data Bank for adult patients who were admitted straight from the trauma scene between April 2019 and December 2020. Massive transfusions, resuscitation techniques, surgery, and urgent interventions were the results. The combined effect of huge transfusion, resuscitation techniques, and surgical operations was referred to as an emergent intervention. Using receiver-operating characteristic curve analysis, the predictive capacity of rSIG for large transfusion was compared to that of the ABC and FASILA scores. They compared rSIG's predictive power to that of the GCS, Shock Index (SI), Triage Revised Trauma score (T-RTS), and Previous Simple Prediction (PSP) score for both resuscitation and surgery. We evaluated rSIG's predictive power to that of T-RTS, PSP, ABC, and FASILA for urgent interventions. Furthermore, studied as a supplement to rSIG was rSIM (Reverse Shock Index multiplied by best motor reaction score). 32,201 individuals were enrolled in the study, and 6,371 of them needed emergency care. For major transfusion, rSIG had the highest area under the receiver-operating characteristic curve (AUROC) (0.846 [95% confidence interval 0.832-0.859]), and it was considerably greater than rSIM, ABC, and FASILA (all $p < 0.0001$). rSIG had the greatest AUROCs (0.777 [0.769-0.785] and 0.731 [0.720-0.741]) for all resuscitative and surgical operations, and these were significantly higher than those for SI, rSIM, GCS, T-RTS, and PSP (all $p < 0.0001$). With respect to emergent interventions, rSIG had the highest AUROC (0.760 [0.753-0.768]) and was statistically superior to rSIM,

T-RTS, PSP, ABC, and FASILA (all $p < 0.0001$). When managing trauma initially, rSIG is a straightforward and reliable point-of-care predictor of emergent treatments.

Kuo SC et al. (2016) [19] employed the reverse shock index (RSI), which measures the ratio of systolic blood pressure (SBP) to heart rate (HR), to assess the trauma patients' hemodynamic condition. The aim of this study was to investigate if, even in the absence of meeting the criteria for multidisciplinary trauma team activation (TTA), RSI<1 can be used to identify high-risk individuals who may undergo shock and have a poor outcome. This is because an SBP lower than the HR (RSI<1) may indicate hemodynamic instability. This is a cross-sectional study. They examined in retrospect the information on 20,106 patients who were admitted for trauma between January 2009 and December 2014, which was collected from the trauma registry system of a level I trauma centre. Patients with RSI<1 who were not assigned to a trauma team (regular patients) were compared to regular patients with RSI≥1. 95% of CIs were used in the calculation of the ORs for related illnesses and injuries. Regular patients with RSI<1 had a death rate of 2.1% vs. 0.5%; OR 3.9, 95% CI 2.10 to 7.08, p<0.001), and a substantially greater proportion of patients had an Injury Severity Score (ISS) ≥25 (OR 2.4, 95% CI 1.58 to 3.62; p<0.001). Regular patients with RSI<1 had a longer length of stay in the intensive care unit than regular patients with RSI≥1. They came to the conclusion that, for patients who did not meet the TTA criteria, an RSI<1 suggests a possibly worse prognosis and calls for more intensive care in the ER.

Akio kimura et al. (2018) [20] The data utilised in this retrospective, multicenter analysis came from 168,517 patients who were recorded between 2006 and 2015 in the Japan Trauma Data Bank. By comparing the areas under receiver operating characteristic curves (AUROCs) of SIA, rSIG, SI (or rSI), and rSIG/A for in-hospital mortality and 24-hour blood transfusion, we were able to determine the discriminant ability. When it came to in-hospital mortality in younger patients (those under 55 years old),

rSIG had the greatest ROC AUC (AUROC), 0.901(0.894–0.908). The AUROC of rSIG/A, 0.845(0.840–0.850), was highest for in-hospital mortality in older patients (≥ 55 years). The distinction between rSIG and rSIG/A, however, was negligible and did not appear to have any clinical significance. Moreover, during a 24-hour blood transfusion, rSIG had the greatest AUROC of 0.745 (0.741–749). It is simple to compute rSIG ((SBP/HR) × GCS score) without the need for further data, equipment, or charts, and it can be a more accurate triage tool for determining risk levels in trauma patients.

Wan-Ting C et al. (2020) [21] For trauma patients, the prognosis is determined using the reverse shock index (rSI), which is a ratio of systolic blood pressure (SBP) to heart rate (HR). For trauma patients, rSI multiplied by the Glasgow Coma Scale (rSIG) may be a more accurate indicator of in-hospital mortality. Nevertheless, in adult severe trauma patients (Injury Severity Score [ISS] > 16) with head injuries (head Abbreviated Injury Scale [AIS] ≥ 2) in the emergency department (ED), rSIG has never been utilised to assess the mortality risk. Adult severe trauma patients (ISS ≥ 16) with head injuries (head AIS > 2) who arrived at the emergency department of two major trauma centers between January 1, 2014, and May 31, 2017, were included in this retrospective case-control study. For the analysis, information on injury mechanisms, laboratory results, management, demographics, vital signs, ISS scores, and outcomes were included. Receiver operating characteristic analysis and logistic regression were employed to assess how well the rSIG score predicted in-hospital mortality. This study comprised a total of 438 patients (mean age: 56.48 years; 68.5% were male). Patients died within the hospital in 24.7% of cases. The interquartile range (median) for the ISS score was 20 (17–26). Individuals who had a rSIG of less than 14 were seven times more likely to die than those who did not (odds ratio: 7.64; 95% confidence interval: 4.69-12.42). The area under the curve values for the rSIG score and the Hosmer-Lemeshow goodness-of-fit test were 0.76 and 0.29, respectively. Sensitivity, specificity, positive predictive value, and negative predictive value for rSIG ≤ 14 were, respectively,0.71,0.75,0.49, and 0.89. The rSIG score is a rapid and simple technique to utilise for predicting in-hospital mortality in adult severe trauma patients with head injuries.

Wu Sc et al. (2018) [18] With reference to mortality predictions made by the Revised Trauma Score (RTS), shock index (SI), and Trauma and Injury Severity Score (TRISS), this study aimed to externally assess the predictive accuracy of the rSIG in our cohort of trauma patients. This study comprised adult trauma patients who were ≥20 years old and admitted to the hospital between January 1, 2009, and December 31, 2017. Based on the patient's initial vital signs and GCS scores when they arrived at the emergency department (ED), the rSIG, RTS, and SI were computed. In-hospital mortality is the primary outcome's endpoint. The area under the curve (AUC) was used to plot the receiver operating characteristic (ROC) curve for 18,750 adult trauma patients. Of these, 24,38 patients had isolated head injuries (only head Abbreviated Injury Scale (AIS) ≥ 2), and 16,312 patients did not have head injuries (head AIS ≤ 1). The objective was to determine the discriminative power of each score to predict mortality. In patients with isolated head injuries (AUC 0.82 vs. AUC 0.85, p = 0.02) as well as in all trauma patients (AUC 0.83 vs. AUC 0.85, p = 0.02), the predictive accuracy of rSIG was considerably lower than that of RTS. There was no discernible difference in the prediction accuracy between rSIG and RTS for patients without head injuries (AUC 0.83 vs. AUC 0.83, p = 0.97). With a sensitivity of 61.5% and specificity of 94.5%, the rSIG can forecast the likelihood of death in trauma patients without a head injury based on a cutoff value of 14.0. Compared to TRISS, both rSIG and RTS had much lower predictive accuracy in all trauma patients (AUC 0.93), as well as in patients with (AUC 0.89) and without head injuries (AUC 0.92). Furthermore, SI significantly underperformed the other three models in terms of prediction accuracy in all trauma patients (AUC 0.57), as well as in patients who had either a head injury (AUC 0.53) or not (AUC 0.63). According to this study, in all adult trauma patients and adult patients with isolated head injuries, rSIG had a considerably higher predictive accuracy of mortality than SI, but in all other analysed populations, it had a lower predictive accuracy of mortality than RTS. Furthermore, when it came to the patients' prediction risk of death, rSIG performed about the same as RTS in the adult patients who had not suffered a head injury.

Massive transfusion:

A major transfusion occurs when 10 units or more of packed red blood cells (PRBCs) or whole blood are given in a 24-hour period. Any transfusion involving more than 20 units of PRBCs within a 24- to 48-hour period is considered an ultra-massive transfusion. The main goal of a huge transfusion is to achieve hemostasis while averting fatal outcomes from serious hypoperfusion-related complications. [22] This issue also examines the importance of major transfusion protocols (MTPs), as well as the uses, limitations, and possible side effects of this life-saving procedure. [23-25]

Massive transfusions may be necessary for patients from several medical specialisations. While heart and vascular surgery is the most prevalent reason for the need for large transfusions, liver transplants, trauma, and gastrointestinal and obstetric haemorrhages are all important causes. Approximately 3% to 5% of trauma patients in the civilian setting and 10% of trauma patients in the military usually require a large transfusion. Despite being relatively uncommon, individuals who require huge transfusions frequently have high mortality rates.

Massive transfusions are erratic and necessitate a large volume of blood products over a long period of time. Therefore, advance coordination between the emergency room, trauma service, surgical team, blood bank, and delivery staff is crucial. One way to forecast when large-scale transfusions may be required is to use the Assessment of Blood Consumption (ABC) score. Throughout a huge transfusion, it is critical to monitor the following: volume status, tissue oxygenation, haemorrhage control, coagulation problems, and acid-base balance. [26] Both the usage of blood products and death rates can be effectively decreased by the development and deployment of MTPs.

Indications:

A huge transfusion may be necessary in any circumstance that causes hemodynamic instability and abrupt blood loss. A huge transfusion may result from a variety of scenarios, including but not limited to bleeding associated with trauma, obstetrical haemorrhage, surgery, and gastrointestinal bleeding. [27,28] There is no

usefulness in trying to reduce confusion about when and whether huge transfusions are necessary by using metrics like the Shock Index. [29]

Based on four variables, a pulse rate greater than 120 bpm, a systolic blood pressure below 90 mm Hg, a positive result on the Focused Assessment with Sonography for Trauma (FAST) exam, and a penetrating thoracic injury, the ABC score is a clinically effective and proven scoring system.

Every variable is given a point, and patients who receive two or more points signal that an MTP is required. A positive predictive value of 50% to 55% is shown by the ABC score, meaning that 45% to 50% of patients who initiate the MTP will not require a large transfusion. The ABC score has a negative predictive value of less than 5%, yet it can identify almost 95% of individuals who need a large transfusion. [30] In general, the following factors indicate when an MTP should be activated:

- Two or more points on the ABC score
- Hemodynamic instability that persists
- Excessive bleeding necessitating angioembolization or surgery
- Transfusion of blood in the trauma bay

Equipment:

A huge transfusion requires two things: blood products must be available, and appropriate intravenous (IV) or intraosseous access must be established. Catheters with a bigger diameter and a shorter length will produce the highest flow rates, according to the Hagen-Poiseuille equation. The length of the catheter and the viscosity of the fluid flowing through it are inversely correlated with the flow rate, which is directly

proportional to the fourth power of the catheter's radius. For the majority of patients receiving a large transfusion, quick blood replacement is essential. Therefore, it is imperative that large-bore catheters, which usually have a gauge of 14 to 18, be assembled and inserted into the patient via intraosseous access or peripheral or central IV, as directed by a physician. [30] The following extra tools or resources could be required:

- Good communication about the changing circumstances around the significant blood loss with blood banks.
- Enough workers to ensure prompt sample collection and the acquisition of blood and blood products.
- A warmer for blood.
- A universal donor product supply, preferably consisting of 8 units of O-negative PRBCs and 8 units of thawed group AB or low titer anti-B group A plasma, should be kept in a blood refrigerator inside the resuscitation area. \
- Surface and in-line fluid warmers are included.
- Constant sensors of core temperature.
- Arterial blood pressure monitor that is intrusive.
- Colloid and crystalloid infusion sets are in sufficient supply.
- IV calcium solutions.
- Point-of-care testing for haemoglobin, electrolytes, lactate, arterial blood gas (ABG), and thromboelastography (TEG), among other physiological parameters.
- To speed up the pace of fluid infusion, use pressure bags or rapid infusion pumps.

Preparation:

Having an MTP in place and promptly notifying the blood bank are critical components of the most efficient preparation. The blood bank can proactively prepare and provide the appropriate products prior to their requirement by promp tly activating the MTP. Healthcare providers are responsible for making sure

patients have appropriate IV or intraosseous access for the administration of blood products, as well as for monitoring their heart and breathing. [30]

Technique or treatment:

The main goals of a large transfusion are to maintain cardiac output and maximise oxygen transport capability. Ordering blood products and getting them quickly from the blood bank is made easier by procedures unique to each institution. MTPs should prioritise the delivery of PRBCs along with platelets and fresh frozen plasma (FFP), even though these protocols may vary throughout institutions. [31-33]

Baseline oxygen delivery to tissues is about four times the oxygen consumption rate of tissues. To preserve blood pressure and tissue perfusion during a transfusion, volume expanders like crystalloids may be used. Even in cases where haemoglobin levels are below normal, the body can nevertheless sustain tissue oxygenation because of the excess oxygen delivery that occurs during a normal physiological state.

Research indicates that in order to ensure that patients receive enough oxygen during transfusions, certain haemoglobin levels are required. It is important to remember, too, that these transfusion standards do not apply in situations involving sudden blood loss.

Haemoglobin measures the amount of haemoglobin molecules in blood, and this amount might vary rather than remain constant. Thus, in situations involving sudden blood loss, the concentration of haemoglobin won't alter. Crystalloid solutions can be used to provide volume expansion to patients who are mildly or moderately unwell. Dilutional coagulopathy is a concern when large amounts of crystalloid solutions are given to critically injured patients in an attempt to revive them.

Due to medical and military research, it has been determined that trauma patients benefit from getting fresh whole blood, which has led to the 1:1:1 ratio of PRBCs, platelets, and FFP transfusions. There is still debate over the ideal proportion of these three elements, and there isn't any strong data to suggest that lower platelet and FFP ratios are inferior. Advocates of the 1:1:1 ratio emphasise its possible advantages, like avoiding overuse of crystalloid solutions. This can lessen the risk of tissue edema, delayed wound healing, prolonged hospital stays, dilutional coagulopathy, and delayed wound healing. While the application of cryoprecipitate, fibrinogen concentrate, and recombinant factor VIIIa yields varying results, warming the blood aids in preventing hypothermia.

Extensive research has demonstrated that severe trauma inhibits fibrinolysis. Strong evidence from military research indicates that tranexamic acid (TXA) can help patients with combat injuries survive longer by reducing coagulopathy. There is more proof that TXA can lower mortality when treating injuries in civilian populations. TXA works by preventing fibrinolysis, or the disintegration of clots, and works best when given three hours after the trauma. Results are worse when TXA is given more than three hours after the trauma. Consequently, a lot of MTPs now include TXA in their processes. [34]

Patients receive O-negative blood at first until cross-matched PRBCs are available. It is advisable to have universally thawed plasma (AB plasma, usually) on hand for the first phase. Low anti-B titers in type A plasma can also be a good option. After blood typing, patients should get group-specific plasma right away. It is essential to observe the patient continuously during the resuscitation procedure.

Procedures for diagnosing coagulopathy and managing the care of acid-base imbalances, hypothermia, and electrolyte imbalances should be part of the protocols. It is customary to evaluate the following parameters following the administration of around five units of PRBCs:

- Platelet count and complete blood count (CBC)
- Prothrombin Time (PT)
- Activated Partial thromboplastin time (aPTT)
- Fibrinogen concentration

Every 20 to 30 minutes, pH, blood gases, electrolytes, and metabolites, including lactate and glucose, should be measured as part of optimal monitoring. TEG evaluates fibrinolysis, clot strength, and platelet function. Thus, based on the particular TEG profile, the test results can help determine when to administer more platelets, plasma, cryoprecipitate, or antifibrinolytics when TEG is available.

The resuscitation objectives in the context of massive transfusion include:

- A mean arterial pressure (MAP) within the range of 60 to 65 mm Hg
- Hemoglobin level between 7 and 9 g/dL
- International normalized ratio (INR) below 1.5
- Fibrinogen levels within the range of 1.5 to 2 g/L
- Platelet counts above 50,000 μL
- pH between 7.35 and 7.45
- Core temperature above 35 °C

Assessment of blood consumption score:

2009 saw the first description of the evaluation of blood consumption (ABC) score in a retrospective single-center study with 596 trauma victims. One point is awarded for the penetrating mechanism; two points are awarded for positive focused assessment sonography for trauma; three points are awarded for arrival systolic blood pressure (SBP) of 90 mmHg or less; and four points are awarded for arrival heart rate (HR) of ≥ 120 beats per minute (bpm). These four unweighted parameters are used to assess blood

consumption. An ABC score of two or above was 75% sensitive and 86% specific for predicting MT in the study. The score runs from 0 to 4. 2010 saw the publication of a revalidation of the ABC score based on a fresh retrospective multi-center research with 1,604 trauma victims. [3]

Trauma Associated Severe Haemorrhage (TASH):

The German Trauma Society (DGU) trauma registry contains clinical and laboratory characteristics. To estimate the likelihood of MT, univariate and multivariate logistic regression analysis were performed on the data [36]. The following seven independent variables were found and utilised to construct the TASH: SBP, Hb, IV, pelvic fractures, complex long bone and/or pelvic fractures, HR, base excess, gender, and seven other factors. The TASH score is between 0 and 28. There is a correlation between rising TASH-score points and rising MT probability. A risk of MT > 50% is indicated by a TASH score of ≥ 16 points. Since its creation, the TASH score has been put to the test in numerous research and is often utilised in trauma centres in Germany.

The Shock Index:

HR divided by SBP is the definition of the shock index (SI). It has proven to be a helpful diagnostic tool for acute hypovolemia, even when SBP or HR are normal. A recent comprehensive analysis that examined SI's ability to predict MT following severe trauma found a link between increased SI and bleeding. ≥ 0.9 was the most commonly recommended ideal SI cut-off value [37]. A retrospective analysis of 8,111 trauma patients assessed the use of prehospital SI and found that patients with pre-hospital SI elevations above 0.9 had a higher risk of metastatic disease (MT) (risk ratio [RR] 1.61, 95% confidence interval [CI], 1.13 - 2.31 for MT when 0.9 < SI < 1.1; RR 8.13, 95% CI, 4.60 - 14.36 when SI > 1.3) [38] A patient is considered to be at risk for MT if their SI is 1 and their SBP is 100 mmHg in addition to their HR of 100 bpm.

GLASGOW COMA SCALE:

Graham Teasdale and Bryan Jennett, two professors of neurosurgery at the University of Glasgow, published the Glasgow Coma Scale for the first time in 1974.[39] The Glasgow Coma Scale (GCS) is used to objectively describe the level of decreased consciousness in all forms of acute medical and trauma patients. Eye-opening, motor, and vocal responses are the three responsiveness dimensions that the scale uses to evaluate patients. A concise, understandable picture of a patient's condition can be obtained by reporting each of these separately.

Each scale component's results can be added together to get a total Glasgow Coma Score, which offers a less thorough explanation but can be a helpful "shorthand" summary of the severity overall.[40]

When the first edition of Advanced Trauma and Life Support advocated using the Glasgow Coma Scale for all trauma patients, its use spread widely in the 1980s. In addition, it was incorporated into the 1988 subarachnoid haemorrhage patient grading system developed by the World Federation of Neurosurgical Societies (WFNS) [41]. Since then, many clinical recommendations and scoring systems for trauma or critical disease sufferers have included the Glasgow Coma Scale and its total score.[42] These include youngsters who are not yet verbal and patients of all ages. Used in more than 75 countries, the Glasgow Coma Scale is a mandatory part of the ICD 11 revision and the NIH Common Data Elements for investigations of head injury. [43-45]

FUNCTION:

Scoring and parameter

Three parameters make up the Glasgow Coma Scale: best motor response (M), best verbal response (V), and best ocular reaction (E). The Glasgow Coma Scale's component reaction levels are "scored" from 1 (no response) to 6 (motor response), 5 (verbal response), and 4 (eye-opening response).

With three being the lowest and fifteen being the highest, the total Coma Score consequently has values between three and fifteen.

The total of the constituent elements' scores makes up the score. For instance, GCS10 = E3V4M3 might be used to represent a score of 10.

Best eye response (4)

1. No eye opening
2. Eye-opening to pain
3. Eye-opening to sound
4. Eyes open spontaneously

Best verbal response (5)

1. No verbal response
2. Incomprehensible sounds
3. Inappropriate words
4. Confused
5. Orientated

Best motor response (6)

1. No motor response.
2. Abnormal extension to pain
3. Abnormal flexion to pain
4. Withdrawal from pain
5. Localizing pain
6. Obeys commands

Concerning Matter

The following elements could impede the Glasgow Coma Scale evaluation:

1. Pre-existing conditions

Obstacles in language

Deficit in cognition or nervous system

Speech difficulty or hearing impairment

2. Consequences of the current course of treatment

Physical (e.g., intubation): A patient's score is marked with the suffix T to signify intubation if they are unable to talk and are only assessed on their motor and eye-opening responses.

Pharmacological (e.g., sedation) or paralysis: Prior to administering sedation, the physician ought to, if at all feasible, ascertain the patient's score.

3. Consequences of further wounds or lesions

cranial or orbital fracture

injury to the spinal cord

COLD-induced hypoxic-ischemic encephalopathy.

Sometimes, the Glasgow Coma Scale cannot be obtained even with the above-mentioned problems resolved. It is imperative that all components be tested and included before reporting the final score, as doing so will result in a low score and maybe misunderstanding.

Clinical significance:

The Glasgow Coma Scale is frequently used to assess responsiveness and inform the early management of patients who have suffered a head accident or other severe brain injury. Emergent care decisions for patients with more severe impairments involve securing the airway and triaging patients to decide which ones should be transferred. In individuals with less severe impairment, decisions are made regarding the necessity of neuroimaging, admission for observation, and discharge. Regular Glasgow Coma Scale evaluations are also essential for tracking a patient's clinical progress and directing therapy adjustments.

The three Scale components yield different information depending on where on the responsiveness spectrum one is [47]. In individuals with more severe impairments, changes in motor response are the main contributing component, with ocular and verbal responses being more helpful to a lesser extent.

It is therefore appropriate to record the clinical findings in each of the three components individually for individual individuals. A valuable summary of the overall index is communicated by the total score but with considerable information loss.

The Glasgow Coma Scale is a reliable indicator of clinically significant traumatic brain injury in paediatric patients, both verbal and preverbal (i.e., requiring neurosurgical intervention, requiring more than 24 hours of intubation, requiring more than two nights of hospitalisation, or resulting in death).[44]

Several recommendations and assessment scores have included the Glasgow Coma Scale. These include the Brain Trauma Foundation's severe traumatic brain injury standards (such as Advanced Trauma Life Support), advanced cardiac life support, intensive care scoring systems (such as APACHE II and SOFA), and trauma guidelines.

METHODOLOGY

SOURCE OF DATA: Trauma patients presenting to Emergency Medicine department of BLDE, Shri B.M Patil Medical College Hospital and Research Centre, Vijayapura, from August 2022 to April 2024 who fulfill the inclusion criteria.

STUDY DESIGN: HOSPITAL-BASED PROSPECTIVE OBSERVATIONAL STUDY.

METHOD OF COLLECTION OF DATA: The data is collected from patients with severe trauma who satisfy inclusion criteria and will undergo detailed history, clinical examination and laboratory investigations.

SAMPLE SIZE:
With the Anticipated Proportion of Trauma patients at 7.2% (ref: Young tark lee et al. study reverse shock index multiplied by Glasgow coma scale as a predictor of Massive Transfusion in trauma), the study would require a sample size of 195 to achieve a power of 80% for predicting Massive Transfusion protocol by rSIG at a two-sided p-value of 0.05 with effect size- 0.059 using G*power software 3.1.9.7 (Exact - Proportion: Difference from constant (binomial test, one sample case).

STATISTICAL ANALYSIS

- Continuous variables with normal distribution will be presented by Mean±SD and abnormal distribution by Median and Inter quartile range. Categorical variables will be presented by Frequency, percentage and Charts.
- For normally distributed continuous variables will be compared using an independent t-test. For not normally distributed variables, Mann Whitney U test will be used.
- Categorical variables will be compared using Chi-square test.
- AUROC curve [25] analysis will be carried out to compare rSIG with previous scoring systems, such as assessment blood consumption (ABC) and trauma-associated severe hemorrhage (TASH) Scores for predicting MTP in trauma patients.
- $p<0.05$ will be considered statistically significant. All statistical tests will perform two-tailed.
- The data obtained will be entered into a Microsoft Excel sheet, and statistical analysis will be performed using JMP Software.

Inclusion criteria:

Trauma patients aged more than 18 years.

Exclusion criteria:

1) Isolated head injury.

2) Cardiac arrest when presented to the ED.

RESULT

TABLE 1: GENDER DISTRIBUTION

Sex	Frequency	Percentage
Male	107	55%
Female	88	45%
Total	195	100%

The analysis of the sample distribution based on sex reveals insightful details about the composition of the sample group. Out of the total sample size of 195 individuals, a significant portion, comprising 107 individuals, are male. This group constitutes 55% of the overall sample. The prominence of males in the sample indicates a slight majority, reflecting their higher representation in this specific study.

Conversely, the female portion of the sample consists of 88 individuals, which translates to 45% of the total sample. While slightly smaller in number compared to their male counterparts, the female representation remains substantial and crucial for the study's findings. This balanced distribution between males and females, albeit with a slight male majority, ensures that the perspectives and characteristics of both sexes are adequately captured and analysed.

This proportional representation is essential for achieving a comprehensive and nuanced understanding of the study's focus. By maintaining a nearly equal distribution, the sample provides a robust foundation for analysing trends, behaviours, and outcomes across both sexes. The data derived from this well-rounded sample will contribute to more accurate and reliable conclusions, enhancing the overall validity of the study.

TABLE 2: Comparative Analysis of Massive and Non-Massive Transfusion Groups

Variable	Massive transfusion group N=20 Mean sd	Non-Massive transfusion group N=175 Mean sd	P value
PT_INR	1.22 +_0.36	1.04 +_0.20	0.0007
aPTT time	34.50 +_8.6	27.40 +_6.0	< 0.0001
Hb	12.70 +_1.05	12.80 +_ 1.6	0.7855
Lactic acid	5.07 +_1.6	2.50 +_ 1.4	<0.0001

In a comparative study of patients undergoing massive transfusion (N=20) versus those not undergoing massive transfusion (N=175), several key parameters were analysed to identify significant differences between the two groups.

The Prothrombin Time International Normalized Ratio (PT_INR) was found to be higher in the massive transfusion group, with a mean of 1.22 ± 0.36, compared to 1.04 ± 0.20 in the non-massive transfusion group, yielding a highly significant P value of 0.0007. Similarly, the activated Partial Thromboplastin Time (aPTT) was markedly elevated in the massive transfusion group, averaging 34.50 ± 8.6, as opposed to 27.40 ± 6.0 in the non-massive transfusion group, with a P value of less than 0.0001.

Haemoglobin (Hb) levels were comparable between the two groups, with the massive transfusion group having a mean of 12.70 ± 1.05 and the non-massive transfusion group slightly higher at 12.80 ± 1.6, showing no significant difference (P value = 0.7855). However, lactic acid levels were significantly elevated in the massive transfusion group, with a mean of 5.07 ± 1.6, in contrast to 2.50 ± 1.4 in the non-massive transfusion group, also with a P value of less than 0.0001.

These findings highlight the marked differences in coagulation parameters and lactic acid levels between patients receiving massive transfusions and those who do not, underscoring the need for careful monitoring and management of these critical variables in transfusion practices.

TABLE 3: Physiological Parameters in Massive vs. Non-Massive Transfusion Groups

Variable	Massive transfusion group N=20 Mean SD	Non-Massive transfusion group N=175 (MEAN SD	P value
Respiratory rate	25 +_2.7	22+_2.4	<0.0001
Heart rate	132 +_7.8	85+_9.0	<0.0001
Systolic Blood pressure	75 +_8.0	120+_10.4	<0.0001
Diastolic blood pressure	60+_7.0	90+_87	<0.0001

A detailed comparison of physiological parameters between patients undergoing massive transfusion (N=20) and those not undergoing massive transfusion (N=175) reveals significant differences. The respiratory rate in the massive transfusion group averaged 25 ± 2.7, significantly higher than the 22 ± 2.4 observed in the non-massive transfusion group, with a P value of less than 0.0001. Similarly, heart rate was notably elevated in the massive transfusion group, with a mean of 132 ± 7.8 compared to 85 ± 9.0 in the non-massive transfusion group, also yielding a P value of less than 0.0001.

Blood pressure parameters further underscore the disparities between the two groups. The systolic blood pressure in the massive transfusion group was significantly lower, averaging 75 ± 8.0, in contrast to 120 ± 10.4 in the non-massive transfusion group, with a P value of less than 0.0001. Likewise, the diastolic blood pressure was markedly reduced in the massive transfusion group, with a mean of 60 ± 7.0, compared to 90 ± 8.7 in the non-massive transfusion group, again with a P value of less than 0.0001.

These pronounced differences in respiratory rate, heart rate, and blood pressure between the two groups highlight the critical impact of massive transfusion on these vital physiological parameters, emphasizing the importance of vigilant monitoring and targeted management in patients undergoing such procedures.

TABLE 4: Clinical Severity and Assessment Scores in Massive vs. Non-Massive Transfusion Groups

Variable	Massive transfusion group N=20 Mean SD	Non-Massive transfusion group N=175 MEAN SD	P value
GCS	8[+_2.4	15+_1.3	<0.0001
shock index	1.34 [+_0.6	o.72[+_0.4	<0.0001
SIA: age shock index	61.02 +_4.5	34.34+_2.7	<0.0001
rSIG: reverse shock index multiplied by Glasgow Coma scale	6.37 [+_ 3	19.54+_2.9	<0.0001
qSOFA: quick Sequential Organ Failure Assessment.	2.00 +_1.0	1+_0.6	<0.0001
ISS: injury severity score.	31.00+_7.4	18.00+_6.1	<0.0001
assessment blood consumption (ABC)	2.00+_0.3	1+_0.2	<0.0001
TASH-Score	21.00+_5.6	10.00+_3.4	<0.0001

A comparative analysis of clinical severity and assessment scores between patients undergoing massive transfusion (N=20) and those not undergoing massive transfusion (N=175) reveals stark contrasts. The Glasgow Coma Scale (GCS) scores were significantly lower in the massive transfusion group, with a mean of 8 ± 2.4, compared to 15 ± 1.3 in the non-massive transfusion group, indicating a higher degree of impaired consciousness (P value < 0.0001).

The shock index, which is a measure of hemodynamic instability, was markedly higher in the massive transfusion group, with a mean of 1.34 ± 0.6, versus 0.72 ± 0.4 in the non-massive transfusion group (P value < 0.0001). The SIA (age-adjusted shock index) and rSIG (reverse shock index multiplied by Glasgow Coma Scale) further highlighted the severity in the massive transfusion group, with values of 61.02 ± 4.5 and 6.37 ± 3, respectively, compared to 34.34 ± 2.7 and 19.54 ± 2.9 in the non-massive transfusion group (P value < 0.0001).

he quick Sequential Organ Failure Assessment (qSOFA) scores averaged 2.00 ± 1.0 in the massive transfusion group, significantly higher than the 1 ± 0.6 observed in the non-massive transfusion group, indicating a greater risk of organ failure (P value < 0.0001). The Injury Severity Score (ISS), which quantifies trauma severity, was also higher in the massive transfusion group, with a mean of 31.00 ± 7.4, compared to 18.00 ± 6.1 in the non-massive transfusion group (P value < 0.0001).

Additionally, the assessment of blood consumption (ABC) score and the TASH (Trauma-Associated Severe Haemorrhage) score were both significantly elevated in the massive transfusion group, with means of 2.00 ± 0.3 and 21.00 ± 5.6, respectively, compared to 1 ± 0.2 and 10.00 ± 3.4 in the non-massive transfusion group, underscoring the higher blood product usage and haemorrhage severity in these patients (P value < 0.0001).

These findings highlight the substantial differences in clinical severity and assessment scores between the two groups, emphasizing the critical condition of patients requiring massive transfusion and the need for intensive management and monitoring.

TABLE 5: Coagulopathy in the Massive Transfusion Group

Coagulopathy	Massive transfusion group N=20	P value
Yes	5 25%	<0.0001
No	15 75%	

The relationship between coagulopathy and massive transfusion was investigated in a recent study. Coagulopathy, a condition in which the blood's ability to coagulate (form clots) is impaired, poses significant challenges during massive transfusions, often required in critical care settings.

The study focused on a sample of 20 patients who required massive transfusions. The objective was to determine the prevalence of coagulopathy within this group and to analyse the significance of this association. Out of the 20 patients, 5 (25%) were found to have coagulopathy. Conversely, 15 patients (75%) did not exhibit signs of coagulopathy. This distribution highlights the substantial proportion of patients who encounter coagulation issues when subjected to massive transfusions.

The statistical analysis conducted to evaluate the association between massive transfusion and coagulopathy yielded a P value of less than 0.0001. This extremely low P value indicates a highly significant relationship, underscoring the critical nature of this finding. In statistical terms, a P value below 0.05 is typically considered significant, and values below 0.0001 denote an even stronger significance. Therefore, the study conclusively demonstrates that patients undergoing massive transfusions are significantly more likely to develop coagulopathy.

This result has important clinical implications. The strong association between massive transfusion and coagulopathy suggests that healthcare providers must be particularly vigilant in monitoring coagulation parameters in these patients. Early detection and appropriate management of coagulopathy can potentially reduce the risk of adverse outcomes. Strategies to mitigate the risk of coagulopathy might include the use of targeted coagulation therapies, regular monitoring of coagulation status, and personalized transfusion protocols.

In conclusion, the study provides compelling evidence of the significant relationship between massive transfusion and the incidence of coagulopathy. These findings emphasize the necessity for enhanced clinical strategies to manage and prevent coagulopathy in patients requiring massive transfusions, ultimately aiming to improve patient outcomes in critical care settings.

TABLE 6: Mortality in the Massive Transfusion Group

Death	Massive transfusion group N=20	P value
Yes	2 10%	<0.0001
No	18 90%	

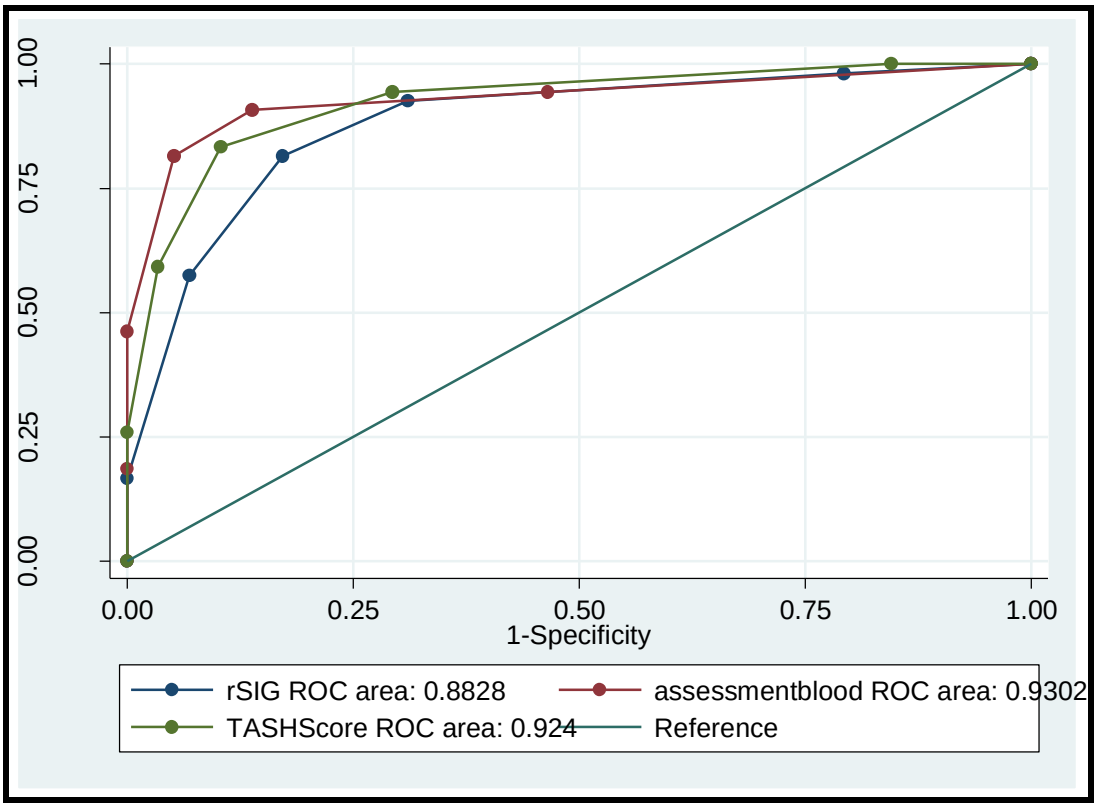
A recent study investigated the mortality rate within a group of patients requiring massive transfusions, shedding light on the critical outcomes associated with this intensive medical intervention. The sample comprised 20 patients, with the goal of assessing the incidence of mortality and its statistical significance.

Out of the 20 patients in the massive transfusion group, 2 patients (10%) unfortunately succumbed, while 18 patients (90%) survived. This distribution highlights the relatively high survival rate but also points to the notable presence of mortality among these critically ill patients.

The statistical analysis revealed a P value of less than 0.0001, indicating a highly significant association between massive transfusion and mortality. In the realm of statistical analysis, a P value below 0.05 is typically considered significant, and a value below 0.0001 underscores a very strong statistical significance. This result strongly suggests that the need for massive transfusion is closely linked with increased mortality risk.

These findings have profound clinical implications. The significant association between massive transfusion and mortality underscores the urgency of comprehensive management strategies for patients requiring such interventions. This might include rigorous monitoring, timely and effective clinical responses, and possibly the development of protocols aimed at reducing mortality rates in this vulnerable patient group.

In summary, the study highlights a crucial aspect of patient outcomes related to massive transfusions, emphasizing the need for heightened clinical awareness and improved management practices to potentially enhance survival rates in patients undergoing massive transfusions.



Graph 1: ROC-rSIG vs ABC vs TASH on X axis 1-specificity with y axis sensitivity.

The ROC curve analysis presented here evaluates the performance of three different diagnostic tests: rSIG, assessment blood, and TASH Score. The ROC curve, which plots sensitivity (true positive rate) against 1-specificity (false positive rate), is a graphical representation of a diagnostic test's ability to discriminate between positive and negative cases. In this analysis, the area under the curve (AUC) serves as a crucial metric for assessing the accuracy of the tests. The results show that the AUC values are 0.8828 for rSIG, 0.930 for assessment blood, and 0.924 for TASH Score. These values indicate that all three tests have high discriminative power, with assessment blood showing the highest accuracy, followed closely by TASHScore and rSIG. The reference line, representing a test with no discriminative ability, is included for comparison. The ROC curves depicted in the graph highlight the superior performance of the assessment blood and TASHScore tests in terms of sensitivity and specificity compared to the rSIG test. This analysis underscores the effectiveness of these diagnostic tools in clinical practice, providing valuable insights into their relative strengths and potential applications in patient care.

DISCUSSION

The current study was to assess the predictive capacity of rSIG in determining mortality time (MT) in patients with severe trauma. Additionally, the study aimed to compare the predictive abilities of rSIG with those of SI, SIA, and qSOFA. The results of the current study indicate that the predictive accuracy of rSIG for MT was significantly superior to SI, SIA, and qSOFA. In addition, the rSIG demonstrated superior AUROC in predicting coagulopathy, in-hospital mortality, and 24-hour mortality compared to other indices.

The rSIG may be quantified by use the reverse shock index and Glasgow Coma Scale (GCS). Systemic Inflammatory Response (SI) is very pragmatic and valuable in evaluating the hemodynamic condition of trauma patients. Nevertheless, the calculation of SI involves dividing HR (heart rate) by SBP (systolic blood pressure), which contradicts the fundamental principle of shock. Hemodynamic instability often refers to a condition where the systolic blood pressure (SBP) is lower than the heart rate (HR). However, it is important to note that hemodynamic instability does not always imply a situation where the HR is lower than the SBP, as shown by the stroke index (SI). In order to enhance this, Chung et al. established the notion of reverse shock index [48], which is computed by dividing SBP by HR, and a low rSI value indicates a serious situation in the patient. Furthermore, the Glasgow Coma Scale (GCS), which evaluates the degree of awareness, is recognised as a more reliable indicator of death risk in individuals with traumatic injuries [49]. rSIG is a fusion of two potent predictors: reverse shock index and GCS.

The rSIG was initially proposed by Kimura and Tanaka in 2018 [50]. An evaluation was conducted on trauma patients from 256 hospitals in Japan between 2006 and 2015 in order to identify a more accurate predictor than the Injury Severity Score (SI) for post-injury mortality and the need for early blood transfusion. The researchers conducted a comparison of several modified models using the SI method and determined that the rSIG model was a dependable tool for evaluating the risk in trauma patients. The reported AUROC of rSIG for in-hospital mortality was 0.901. Wu et al. conducted an external validation of the rSIG in patients who were hospitalised to a level 1 trauma centre in Taiwan [51]. The study's findings indicated that the predictive accuracy of death was

greater with rSIG compared to SI in trauma patients. The AUROC of rSIG for mortality prediction was 0.83. In a recent study, Chu et al. utilised rSIG to assess the in-hospital mortality rate among patients with severe trauma and brain damage [52]. They discovered that the use of rSIG was beneficial in predicting the mortality risk in severe trauma patients with brain damage. The current study found that the AUROC (Area Under the Receiver Operating Characteristic) of rSIG (a specific measure) for predicting in-hospital mortality was 0.812. Furthermore, the predictive value of rSIG for mortality was better than that of SI (another measure), SIA (another measure), and qSOFA (another measure). The findings align with the outcomes of previous investigations, indicating that rSIG serves as a valuable indicator of death in trauma patients. One noteworthy aspect of our investigation is that all instruments, including rSIG, have a low positive predictive value (PPV) and a high negative predictive value (NPV) for medical treatment (MT) and death. The low occurrence of MT (7.2%) and in-hospital death (8.4%) [53] is the likely cause of this phenomenon.

It is worth mentioning that the majority of prior research has examined the correlation between rSIG and mortality in trauma patients. As far as we know, there have been no studies that have revealed the ability to predict mortality in individuals with severe trauma. The AUROC of rSIG for MT in our study was 0.842, indicating that rSIG had a superior predictive value compared to SI, SIA, and qSOFA. The underlying cause for this outcome is ambiguous. One potential reason is that traumatic brain injury may be accompanied by scalp lacerations, facial bone fractures, and oronasal bleeding, which can cause bleeding [54]. Additionally, a trauma patient can experience significant mental decline even without brain injury if they fall into severe shock [55]. Therefore, the incorporation of both a bleeding measure (rSI) and consciousness assessment (GCS) provides a more comprehensive evaluation of the patient's trauma condition. An advantage of our study is that we have determined that rSIG can serve as a prognostic indicator for coagulopathy. Approximately one-third of trauma patients treated through the Emergency Department (ED) experience coagulopathy, which can lead to multiple organ failure and a significant risk of death [56,57]. There are two forms of trauma-induced coagulopathy: acute traumatic coagulopathy (ATC) and resuscitation-associated coagulopathy. ATC in trauma patients refers to the coagulopathy that is caused directly by the trauma itself. On the other hand, resuscitation-associated

coagulopathy is coagulopathy that is worsened by factors such as hypothermia, metabolic acidosis, consumption of coagulating factors, and haemodilution [58]. Early identification of coagulopathy can result in the initiation of rewarming, correction of acidosis, balanced transfusion, and activation of massive transfusion protocol (MTP). Based on our current understanding, this study is the first to use rSIG to make predictions about coagulopathy. Furthermore, our investigation showed that rSIG has superior predictive accuracy compared to SI, SIA, and qSOFA.

CONCLUSION

The present study aimed to evaluate the predictive capacity of the reverse Shock Index multiplied by the Glasgow Coma Scale (rSIG) for determining the need for massive transfusion (MT) in patients with severe trauma. Additionally, the study compared the predictive abilities of rSIG with those of the Shock Index (SI), age-adjusted SI (SIA), and quick Sequential Organ Failure Assessment (qSOFA). The results demonstrate that rSIG has superior predictive accuracy for MT, in-hospital mortality, 24-hour mortality, and coagulopathy compared to SI, SIA, and qSOFA. Specifically, the AUROC for rSIG in predicting in-hospital mortality was 0.812, highlighting its reliability as a prognostic tool. The study's findings align with previous research, confirming the effectiveness of rSIG as a valuable indicator of mortality and coagulopathy in trauma patients. The values in ROC suggest that all three tests exhibit significant discriminatory ability, with assessment blood consumption demonstrating the highest level of accuracy, closely followed by TASHScore and rSIG.Key findings from the study include the AUROC of rSIG for MT being 0.842, indicating a higher predictive value compared to SI, SIA, and qSOFA. rSIG outperformed SI, SIA, and qSOFA in predicting coagulopathy, in-hospital mortality, and 24-hour mortality. rSIG combines the assessment of hemodynamic instability (reverse SI) and consciousness (GCS), providing a more comprehensive evaluation of a trauma patient's condition. Early identification of coagulopathy using rSIG can facilitate timely interventions, including rewarming, correction of acidosis, balanced transfusion, and activation of massive transfusion protocols. Overall, the study supports the use of rSIG as a practical and effective tool for early identification of trauma patients at high risk for massive transfusion, coagulopathy, and mortality. Implementing rSIG in clinical settings could enhance patient outcomes by enabling prompt and appropriate management of severe trauma cases.

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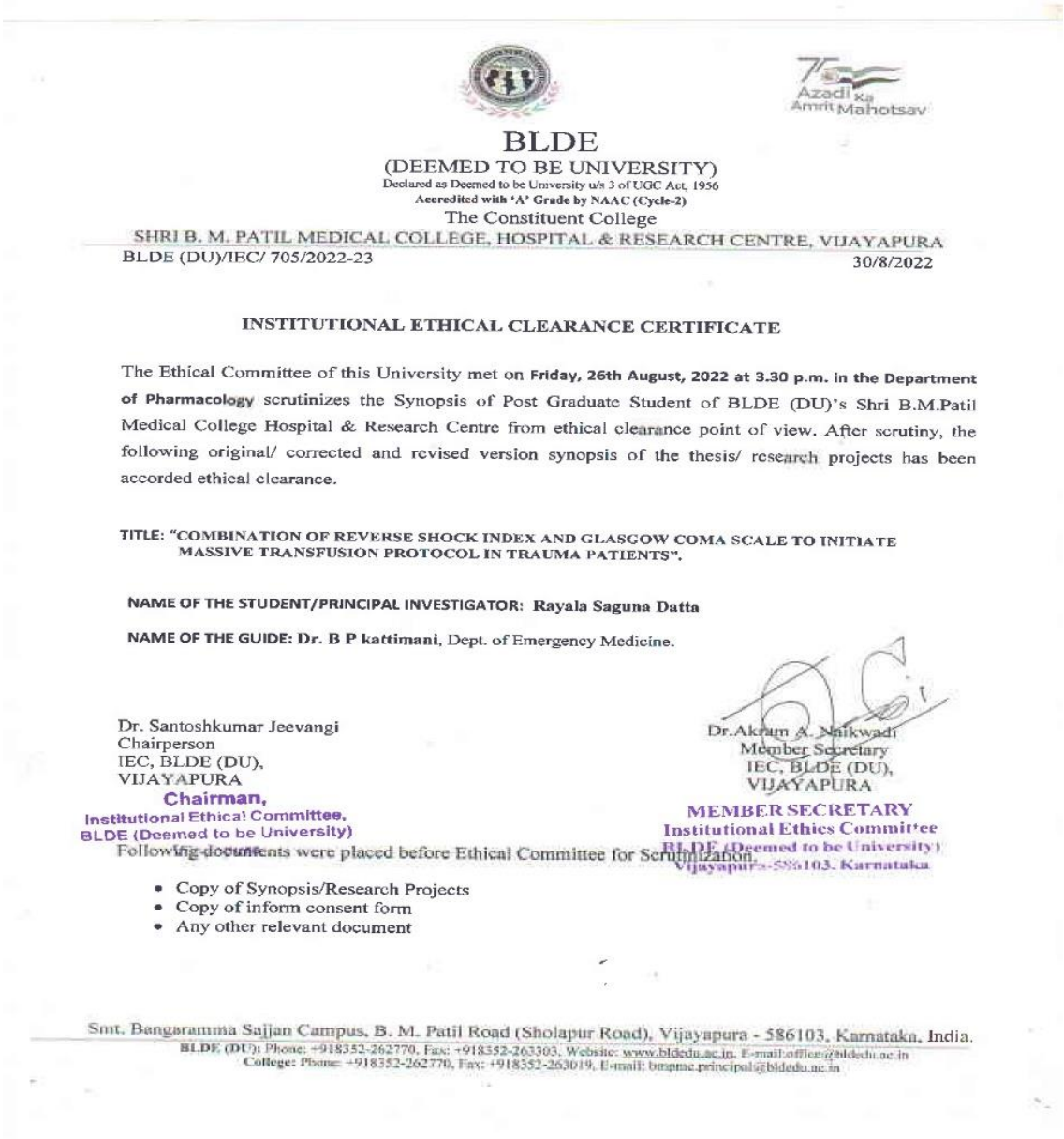
ANNEXURE I

CERTIFICATE OF ETHICAL CLEARANCE



BLDE
(DEEMED TO BE UNIVERSITY)
Declared as Deemed to be University u/s 3 of UGC Act, 1956
Accredited with 'A' Grade by NAAC (Cycle-2)
The Constituent College
SHRI B. M. PATIL MEDICAL COLLEGE, HOSPITAL & RESEARCH CENTRE, VIJAYAPURA

BLDE (DU)/IEC/ 705/2022-23 30/8/2022

INSTITUTIONAL ETHICAL CLEARANCE CERTIFICATE

The Ethical Committee of this University met on **Friday, 26th August, 2022 at 3.30 p.m. in the Department of Pharmacology** scrutinizes the Synopsis of Post Graduate Student of BLDE (DU)'s Shri B.M.Patil Medical College Hospital & Research Centre from ethical clearance point of view. After scrutiny, the following original/ corrected and revised version synopsis of the thesis/ research projects has been accorded ethical clearance.

TITLE: "COMBINATION OF REVERSE SHOCK INDEX AND GLASGOW COMA SCALE TO INITIATE MASSIVE TRANSFUSION PROTOCOL IN TRAUMA PATIENTS".

NAME OF THE STUDENT/PRINCIPAL INVESTIGATOR: Rayala Saguna Datta

NAME OF THE GUIDE: Dr. B P kattimani, Dept. of Emergency Medicine.

Dr. Santoshkumar Jeevangi
Chairperson
IEC, BLDE (DU),
VIJAYAPURA
Chairman,
Institutional Ethical Committee,
BLDE (Deemed to be University)

Dr.Akram A. Naikwadi
Member Secretary
IEC, BLDE (DU),
VIJAYAPURA
MEMBER SECRETARY
Institutional Ethics Committee
BLDE (Deemed to be University)
Vijayapura-586103, Karnataka

Following documents were placed before Ethical Committee for Scrutinization.

- Copy of Synopsis/Research Projects
- Copy of inform consent form
- Any other relevant document

Smt. Bangaramma Sajjan Campus, B. M. Patil Road (Sholapur Road), Vijayapura - 586103, Karnataka, India.
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College: Phone: +918352-262770, Fax: +918352-263019, E-mail: bmpmc.principal@bldedu.ac.in

ANNEXURE II

RESEARCH INFORMED CONSENT FORM

BLDE (Deemed to be University)

Shri. B.M. PATIL Medical College, Hospital & Research Centre,

VIJAYAPURA-586103

TITLE OF THE PROJECT: COMBINATION OF REVERSE SHOCK INDEX AND GLASGOW COMA SCALE TO INITIATE MASSIVE TRANSFUSION PROTOCOL IN TRAUMA PATIENTS.

GUIDE: Dr. B.P. KATTIMANI,

M.S. GENERAL SURGERY,

ASSOCIATE PROFESSOR,

DEPARTMENT OF EMERGENCY MEDICINE.

PG STUDENT: Dr. RAYALA SAGUNA DATTA

DEPARTMENT OF EMERGENCY MEDICINE

PURPOSE OF RESEARCH:

I have been explained about the reason for doing this study and selecting me as a subject for this study. I have also been given free choice for either being included or not in this study.

PROCEDURE:

I am aware that in addition to routine care received, I will be asked a series of questions by the investigator. I have been asked to undergo the necessary investigations and treatment, which will help the investigator in this study.

RISK AND DISCOMFORTS:

I understand there is no risk involved and that the patient may experience some discomforts due to panic situation during the examination. This is mainly the observational study and no risk is involved in the study. All the data collected would be kept safe and private.

BENEFIT:

I do understand that my participation in this study will have no direct benefits to me, other than the potential benefit of the research and education.

CONFIDENTIALITY:

I understand that the medical information produced by this study will become a part of hospital records and will be subjected to confidentiality. Any information about sensitive, personal nature will not be a part of the medical record but will be stored in the investigations research file. If any of the data are used for publication in the medical literature or for teaching purpose, no name will be disclosed, and other

identifiers such as photographs will be used only with special written permission taken priorly. I also understand that I may visualize the photograph before granting permission.

REQUEST FOR MORE INFORMATION:

I understand that I may ask questions about the study at any time; Dr. RAYALA SAGUNA DATTA at the department of Emergency Medicine is available to answer my questions or concerns. I understand that I will be informed of any significant new findings discovered during the course of the study, which might influence my continued participation. A copy of this consent form will be given to me to keep for careful reading.

REFUSAL FOR WITHDRAWAL OF PARTICIPATION:

I understand that my participation is voluntary and that I may refuse to participate or may withdraw consent and discontinue participation in the study at any time without prejudice. I also understand that Dr. RAYALA SAGUNA DATTA may terminate my participation in the study after he has explained the reasons for doing so.

INJURY STATEMENT:

I understand that in the unlikely event of injury to me, resulting directly for participation in this study; if such injury were reported promptly, the appropriate treatment would be available to the patient. But no further compensation would be provided by the hospital. I understand that by my agreements to participate in this study and not waiving any of my legal rights.

I have been explained about the purpose of the research, the procedures required and the possible risks to the best of my ability.

_____ _____

Dr. RAYALA SAGUNA DATTA Date

(Investigator)

STUDY SUBJECT CONSENT STATEMENT:

I confirm that Dr. RAYALA SAGUNA DATTA has explained to me the purpose of the research, the study procedures that I will undergo, and the possible risks and discomforts as well as benefits that I may experience in my own language. I have read the form and understand this consent.

Therefore, I agree to give consent to participate as a subject in this research project.

_____

_____

Participant / Guardian Date:

_____

Witness to signature Date:

ANNEXURE III

PROFORMA FOR TAKING CASE

Informant:

Name:	CASE NO:
Age:	IP NO:
Sex:	DOA:
Occupation:	DOD:
Residence:	Contact Number:

BLOOD GROUP and RH TYPE:

DIAGNOSIS:

Presenting complaints with duration:

Past History:

Vitals:

HR:

BP:

RR:

SPO2:

Temp:

GCS:

eFAST (+/-):

NATURE OF INJURY:

Head-to-toe examination:

ABC SCORE:

TASH SCORE:

Need for Mechanical ventilation(yes/no):

Need for Massive Transfusion(yes/no):

No units of blood transfused within 24 hrs: packed red blood cells:

Platelets:

Fresh frozen plasma:

Mortality within 24-h(yes/no):

No of days of hospital stay:

In-hospital mortality(yes/no):

CAUSE OF DEATH (if died):

INVESTIGATIONS:

1) Hemoglobin gm. %

2) Platelet count

3) PT/INR

4) aPTT

5) LACTATE LEVEL

6) BASE EXCESS

7) PH

X-RAY FINDINGS:

Date: -

Signature: -

ANNEXURE IV

KEY TO MASTER CHART

SL.NO	**Serial Number**
IP NO	**Inpatient Number**
HB%	**HEMOGLOBIN%**
HR	**Heart Rate**
RR	**Respiratory Rate**
SBP	**Systolic Blood Pressure**
DBP	**Diastolic Blood Pressure**
SI	**Shock Index**
SIA	**Shock Index*Age**
GCS	**Glasgow Coma Scale**
ISS	**Injury Severity Score**
qSOFA	**Quick Sequential Organ Failure Assessment**
ABC	**Assessment Blood Consumption**
TASH	**Trauma Associated Severe Hemorrhage**
rSIG	**Reverse Shock Index*Glasgow Coma Scale**

*

ANNEXURE V: MASTER CHART

"COMBINATION OF REVERSE SHOCK INDEX AND GLASGOW COMA SCALE TO INITIATE MASSIVE TRANSFUSION PROTOCOL IN TRAUMA PATIENTS."

S.NO	NAME	GENDER	AGE	IP NO	TRANSF	PT/INR	aPTT	Tlb	Hb	LACTIC	RR	HR	SBP	DBP	GCS	SHOCK I SIA	iSIG	qSOFA	ISS	ABC	TASH sc	COAGUL	DEATH
1	REVANSIDDA PUJARI	M	62	408668	Non-mass	1.5	22	11	3	20	93	110	82	14	1	32	20	1	24	1	8		
2	Adiveappa Dodamani	M	42	400492	Non-mass	2.2	31	14	1	23	82	128	90	14	1	31	17	1	22	2	10		
3	Savitri Biradar	F	45	385328	Non-mass	1.94	23	14	2	22	78	129	81	15	1	35	21	1	24	2	11		
4	Laxmi Baluti	F	58	399426	Non-mass	0.98	32	12	3	22	78	126	92	16	2	32	18	1	22	2	7		
5	Gururaj Angadi	M	64	429413	Non-mass	2.1	27	14	3	25	86	118	97	15	1	34	1	1	23	1	12		
6	Vishwanath Kusur	M	47	178243	Non-mass	2	24	13	1	27	88	120	90	16	1	31	17	1	22	1	9		
7	Lakkappa Muktenavar	M	52	121503	Non-mass	2	30	12	2	23	78	112	83	15	1	36	20	2	24	1	13		
8	Tanuja patil	F	46	121740	Non-mass	2.2	28	11	1	24	81	110	90	16	1	34	19	2	23	1	12		
9	parvati hosangadi	F	69	177095	Non-mass	0.9	25	11	3	26	82	115	84	14	2	33	21	2	23	3	11		
10	ravi Pol	M	55	175454	Massive	2	37	11	4	26	126	68	56	5	2	62	7	1	27	2	18	Yes	
11	Malappa Bagewadi	M	53	172934	Non-mass	1.2	33	13	2	26	93	119	84	14	2	34	18	1	22	1	13		
12	Sangappa Waddar	M	48	172241	Non-mass	1.9	24	13	2	25	83	114	84	16	1	31	18	1	22	3	12		
13	Shivani kadakbhavi	F	47	168441	Non-mass	1.8	23	12	3	23	78	129	96	15	1	36	17	1	22	3	9		
14	Ningavva Biradar	F	56	162980	Massive	3	40	11	6	22	136	82	63	10	2	59	6	2	31	3	26	No	
15	Sundra Olekar	M	53	161932	Non-mass	3.2	31	13	3	23	78	112	91	14	2	34	17	1	30	1	11		
16	Mahadev hunnur	M	46	429413	Non-mass	2.8	30	12	1	23	86	126	89	14	1	31	21	2	23	1	7		
17	Isharavva Gani	M	63	407207	Non-mass	3.1	30	12	2	22	88	127	84	16	2	36	18	1	24	2	12		
18	Malanna Totad	M	66	429356	Non-mass	1.5	23	14	3	20	90	124	85	16	2	32	18	2	23	2	9		
19	ramarao sawanth	M	46	443946	Non-mass	1.9	29	11	1	23	90	120	84	15	1	31	19	1	23	1	8		
20	Mallamma mashyal	F	43	424046	Massive	0.9	35	13	5	22	128	76	54	6	2	61	6	3	30	2	20	No	
21	Saleem shaikh	M	52	197882	Non-mass	0.8	31	14	2	22	90	114	91	15	1	34	18	1	24	2	11		
22	Mehiboobasab Walikar	M	52	314417	Non-mass	1.3	29	12	2	22	84	130	92	16	1	51	18	1	22	2	8		
23	Jayashree uddeshnath	F	44	372615	Non-mass	1.9	26	11	1	26	86	116	86	15	2	36	19	1	24	1	9		
24	Vachu Rathod	M	62	332489	Non-mass	1.8	25	13	1	26	78	110	89	16	1	35	17	1	24	1	9		
25	Praveen Kumar	M	72	136159	Non-mass	1.5	33	13	3	25	80	115	94	15	1	32	23	1	22	1	10		
26	Pooja Rathod	F	76	387089	Non-mass	2.6	32	11	2	25	90	116	90	16	2	34	17	1	24	1	11		
27	Reshma Shek	M	70	319924	Massive	29	29	13	5	26	132	80	61	9	1	58	8	2	27	2	21	Yes	Yes
28	sabana kudchai	F	82	167412	Non-mass	2.6	22	14	4	26	91	115	96	15	2	35	19	2	23	1	11		
29	mallappa huded	M	45	171053	Non-mass	1.6	30	14	1	25	87	120	83	16	1	31	20	1	24	2	7		
30	shrisail sawanth	M	61	334221	Non-mass	2.9	23	14	1	25	88	126	90	14	1	36	19	2	23	2	12		
31	Dundappa Surjapur	M	52	143624	Non-mass	2.7	31	13	2	22	90	118	84	16	1	34	21	2	23	2	9		
32	Akkamma koryal	F	72	185540	Non-mass	1.7	22	12	3	23	76	120	95	15	1	33	19	2	22	1	12		
33	Hasansab talikoti	M	82	217048	Massive	3.1	25	14	6	21	126	68	60	7	1	61	5	1	31	2	19	No	
34	Chandrashekhar devar	M	74	345895	Non-mass	1.9	29	11	2	23	90	115	97	16	2	34	18	1	22	1	7		
35	Kasturi Bandal	F	56	391981	Non-mass	3.4	23	13	4	22	78	117	84	15	2	31	19	1	24	2	9		
36	Ningappa bairadagi	M	65	321981	Non-mass	3.5	22	14	1	22	78	115	85	16	2	36	17	1	23	3	12		
37	Nenappa awate	M	72	221555	Massive	3	27	12	3	24	134	78	59	6	1	59	5	2	35	1	23	No	
38	Iramma Gasti	M	53	80243	Non-mass	2.3	24	13	3	23	88	126	83	14	1	35	19	1	24	1	7		
39	Kamlabai ragati	F	62	101190	Non-mass	2.1	26	14	4	22	86	118	91	16	2	31	17	2	22	2	12		
40	bhagyashree talwart	F	65	56604	Non-mass	1.9	32	12	2	23	87	120	90	15	2	35	17	2	24	2	9		
41	shankarayya yadwadmath	M	42	105775	Non-mass	1.3	25	11	2	22	85	115	98	15	2	32	20	2	22	1	8		
42	topu rathod	M	69	101207	Non-mass	1.4	24	13	1	23	90	118	83	14	1	34	19	1	24	2	7		
43	subasini walikar	F	52	159465	Non-mass	0.8	22	14	2	22	90	126	90	16	1	35	21	2	25	1	9		
44	Girija Biradar	F	46	324368	Non-mass	1.9	30	13	1	26	84	118	84	15	2	32	18	1	23	2	13		
45	gurabasu hatti	M	61	158279	Non-mass	1.8	21	12	3	22	80	120	89	15	1	34	19	2	27	3	10		
46	sanjay badiger	M	49	196695	Massive	2.2	33	12	4	23	127	70	58	5	2	56	4	3	33	1	22	No	
47	Channamma Kurle	F	68	203286	Non-mass	2.1	27	14	2	23	92	115	83	14	1	32	23	1	**22**	1	18		
48	ishwaramma bandagar	F	75	257683	Non-mass	0.9	29	14	2	22	93	117	90	16	1	35	14	1	23	2	13		
49	SHRIMANTH KOLURGI	M	80	386405	Non-mass	2.6	33	12	3	23	82	127	84	15	1	35	17	2	23	2	11		
50	Guralingappa Biradar	M	59	126984	Non-mass	1.8	22	13	4	24	78	119	86	15	1	32	21	2	23	3	8		

51	Shantabhai Hiremath	F	81	182772	Non-mass	1.2	33	14	4	26	87	120	89	16	1	34	18	1	22	1	9		
52	LAXMAN VIBHUTI	M	73	203859	Non-mass	1.32	30	12	1	26	76	121	94	15	1	31	17	2	22	1	11		
53	KAVERI KENGANAL	F	64	221901	Non-mass	1.36	27	11	2	23	88	129	95	14	2	35	21	1	22	1	8		
54	BASAVRAJ TAKKALAI	M	68	218147	Non-mass	1.56	24	13	3	23	90	127	84	16	2	34	18	2	22	1	9		
55	Lingesh Hirur	M	53	225217	Non-mass	0.9	31	13	1	22	87	130	86	15	1	33		1	23	1	7		
56	Rekha Ghagare	F	68	155585	Massive	0.7	38	12	3	26	135	76	61	10	1	65	7	2	27	2	17	No	
57	RIYAN NADAF	M	47	120310	Non-mass	2.1	24	11	1	21	90	127	98	14	1	31	19	1	22	2	11		
58	DASHARATH SURYAV	M	52	278509	Non-mass	2.3	32	13	2	23	84	110	89	14	1	33	20	1	24	1	7		
59	VIJAYA SURYAVANSH	F	42	271924	Non-mass	1.54	32	12	3	24	92	115	84	16	1	34	17	2	23	2	12		
60	SUNITA SHIRAMGOND	F	56	213478	Non-mass	2.31	27	12	4	26	78	117	85	15	1	35	21	1	24	1	7		
61	SHIVRAM JADHAV	M	72	288926	Non-mass	1.65	29	14	4	26	78	121	97	14	2	32	18	1	22	2	9		
62	BASAMMA HIREKURE	F	75	108630	Non-mass	1.48	26	11	3	23	86	122	84	14	1	34	19	2	23	1	13		
63	KOMU RATHOD	M	46	170785	Non-mass	1.98	28	13	3	22	88	122	85	15	1	36	17	1	29	1	12		
64	RAJESH RATHOD	M	54	199848	Non-mass	1	30	14	3	23	78	124	85	15	1	34	20	2	24	2	11		
65	NARASAMMA KUMBH	F	76	198546	Non-mass	2.31	29	13	1	24	92	124	98	14	33	31	19	1	22	1	18		
66	SHRISHAIL GAVARI	M	86	251106	Non-mass	1.47	32	13	1	22	80	127	82	16	35	36	21	2	24	2	10		
67	MAHANTGAUDA BADA	M	42	183051	Massive	1.55	35	13	3	24	127	80	60	8	2	65	7	3	25	1	24	Yes	Yes
68	SAVITA PUJARI	F	58	106354	Non-mass	1.25	23	14	4	23	93	126	90	15	1	32	20	1	22	1	9		
69	DURGA HAJERI	F	62	33134	Non-mass	1.34	31	14	1	22	82	118	83	15	1	31	20	2	24	1	13		
70	VEERBHADRA NEMAC	M	54	447866	Non-mass	0.87	24	13	2	22	78	120	90	14	2	35	17	1	23	3	9		
71	SHIVAPPA BAGALI	M	61	86585	Non-mass	0.95	31	12	1	22	85	126	84	16	1	32	21	1	23	1	10		
72	Laxmibai Bantanor	F	67	83641	Non-mass	1.4	26	13	2	23	88	120	86	15	1	34	18	2	27	2	11		
73	DODAPPA CHITTAPUR	M	58	183954	Non-mass	1.6	27	14	3	22	90	119	89	14	2	31	19	2	24	2	8		
74	SUNIL HATGAR	M	67	74269	Non-mass	1.54	29	12	2	21	78	119	94	16	1	36	17	1	24	1	9		
75	AKANKSHA Hakari	F	57	307122	Non-mass	2	33	11	1	20	79	120	91	15	1	34	20	1	24	1	13		
76	PAVANI YALAMALI	F	53	251876	Non-mass	1.28	22	13	2	23	84	110	85	15	2	35	19	1	22	2	12		
77	SUHASINI WALIKAR	F	47	34783	Non-mass	1.69	27	13	3	22	79	115	89	16	1	36	21	2	24	3	11		
78	Hanamant Bajantri	M	53	269729	Non-mass	1.56	29	12	4	22	92	124	94	15	1	34	20	1	26	1	18		
79	Vittal Naykodi	M	66	55505	Non-mass	1.23	26	14	1	23	89	126	95	14	1	31	19	2	23	2	13		
80	Laxmibai Sahebagond	F	56	55470	Non-mass	1.25	30	13	4	22	90	128	97	16	1	36	21	1	23	1	9		
81	GURABASU HITTI	M	40	378585	Non-mass	1.45	29	12	4	26	84	110	93	15	1	35	19	1	26	1	9		
82	SHIVANI Bomanahalli	F	33	211024	Massive	1.23	29	12	6	26	78	82	55	8	2	60	7	3	29	2	20	No	
83	Parashuram Kattimani	M	37	126960	Non-mass	1.56	31	14	4	22	85	112	89	15	1	32	21	1	24	2	7		
84	SHABIR BADEKAN	M	35	348148	Non-mass	1.47	23	14	1	23	84	120	88	16	1	36	24	2	28	1	9		
85	SHANTABAI BADIGER	F	62	55476	Massive	1.89	31	12	6	24	132	82	61	9	1	58	4	2	30	2	22	No	
86	Vijayalaxmi Rathod	F	40	238978	Non-mass	0.78	32	13	3	23	79	129	89	14	1	36	20	1	22	1	8		
87	Jyotis Mahto	M	52	297505	Non-mass	1.78	27	11	6	22	78	127	94	14	2	32	23	1	28	2	10		
88	Murasid Ansari	M	38	86643	Non-mass	1.25	22	12	2	22	86	122	95	15	2	34	25	2	22	1	11		
89	Kalpana Hiremath	F	54	341767	Non-mass	1.25	30	14	4	23	88	118	83	16	2	33	17	2	23	1	7		
90	SUNIL Tambe	M	45	168576	Non-mass	1.45	23	11	1	22	92	127	90	15	1	31	20	1	23	2	12		
91	AMRUT Navi	M	52	51109	Non-mass	1.6	29	13	3	24	80	114	84	16	2	35	19	2	27	1	9		
92	Geeta Jadhav	F	56	24691	Non-mass	1.8	33	12	3	23	93	115	91	15	2	32	21	1	22	2	13		
93	Shanubai Naik	M	60	146095	Non-mass	1.65	22	12	3	26	82	128	86	16	1	34	20	2	25	1	10		
94	Baganna Biradar	M	48	326063	Non-mass	1.9	22	14	3	23	78	110	89	15	1	31	17	1	22	2	12		
95	Yallamma Biradar	F	45	315535	Non-mass	1.92	31	14	1	22	77	115	94	15	2	36	21	1	24	1	9		
96	Mahadevi Biradar	F	39	445243	Non-mass	2	23	12	2	22	88	116	83	14	1	32	22	2	22	1	10		
97	Devraj Nala	M	29	108407	Massive	0.2	42	13	5	23	128	68	59	7	2	61	8	1	37	2	25	No	
98	Hanamant Jivajigol	M	58	70184	Non-mass	1.9	31	12	1	22	78	120	83	16	1	31	18	1	22	1	11		
99	Chidanand Balagavi	M	55	115264	Non-mass	2.1	23	11	3	22	86	114	90	14	2	35	19	1	24	3	7		
100	SAVITA JADHAV	F	39	38797	Non-mass	2.56	24	12	1	22	87	128	84	15	2	32	17	2	25	3	12		

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101	Shivashankaragoud Patil	M	46	175552	Non-mass	2.47	32	14	2	23	93	110	97	16	1	34	21	1	23	3	9		
102	Vithabai Koli	F	48	409053	Non-mass	1.58	22	11	3	26	82	122	84	15	1	34	18	2	22	1	10		
103	Bhimanna Hadiman	M	35	192649	Non-mass	1.65	31	12	4	23	78	118	85	15	2	31	20	1	24	1	13		
104	INDABAI MANVAR	F	52	223318	Non-mass	1.25	23	12	4	22	86	114	87	16	1	36	19	2	28	1	12		
105	Mallika Kudari	F	41	191245	Non-mass	1.29	26	14	1	22	88	128	87	15	2	35	21	1	22	1	11		
106	AKSHAY Basaragav	M	45	307188	Non-mass	1.85	27	12	2	26	90	128	83	14	2	32	19	1	24	1	18		
107	Ravindra Biradar	M	50	86101	Non-mass	1.64	22	13	3	26	92	110	90	16	2	34	20	1	23	3	12		
108	RAJARAM PALASKAR	M	54	112727	Non-mass	1	30	14	1	22	80	122	84	15	1	35	20	2	22	2	9		
109	SANTOSHI CHAVAN	F	36	149240	Non-mass	2.5	23	12	2	22	79	114	97	14	1	32	22	2	27	2	9		
110	LAXMI KANNUR	F	38	123002	Non-mass	2.65	28	11	3	23	75	128	84	16	2	34	21	1	28	2	12		
111	SHANTA SURYAWANS	F	58	13540	Massive	2.6	39	13	4	25	136	72	65	10	1	64	8	1	25	1	27	No	
112	NASHIR CHAUDHARI	M	54	191414	Non-mass	1.54	32	13	3	21	80	117	97	16	1	36	18	1	23	2	11		
113	DODAMMA NARAYAN	F	62	397008	Non-mass	1.57	27	12	3	20	86	127	84	14	1	34	20	1	22	1	11		
114	CHANDRASHEKHAR T	M	64	184850	Non-mass	1.53	31	11	1	23	90	110	86	16	2	35	17	2	23	3	7		
115	KAMALABAI JADHAV	F	59	380462	Non-mass	2.35	23	13	1	22	84	122	89	15	1	32	21	2	22	3	12		
116	SIDDHU NATIKAR	M	34	70184	Non-mass	0.68	33	14	2	22	92	129	94	14	2	34	21	1	22	1	9		
117	BASAVRAJ KOLI	M	51	395003	Massive	1.35	34	11	5	24	130	75	63	9	2	59	9	3	31	3	19	Yes	
118	CHANAMMA MAYR	F	53	158853	Non-mass	1.2	24	12	3	22	90	116	89	15	1	32	19	1	23	2	7		
119	BABU KAVALAGI	M	58	6495	Non-mass	1.65	32	14	2	24	80	128	94	15	1	31	17	1	23	3	9		
120	RAMGONDA PATIL	M	35	22618	Non-mass	1.98	27	13	1	24	81	110	95	16	1	35	20	2	27	3	8		
121	ANASUYA ROOTI	F	41	128199	Non-mass	1.87	29	12	2	25	86	122	83	15	1	34	19	2	24	3	10		
122	SALMA MOKASHI	F	48	129943	Non-mass	1.8	26	11	4	25	91	128	90	16	1	35	21	2	23	2	11		
123	KALLAPPA TELI	M	56	131544	Non-mass	1.36	28	13	2	26	91	110	84	15	2	32	18	2	23	1	7		
124	SOMANINGAPPA NAR	M	51	161900	Non-mass	2.54	31	13	1	26	84	131	86	15	1	36	19	2	22	1	12		
125	Shankaramma Chikkond	F	52	131821	Non-mass	1.3	23	12	3	23	88	130	89	14	1	34	17	2	22	1	9		
126	AJIT PATIL	M	55	131843	Non-mass	2	27	11	4	25	92	122	94	16	1	6	18	2	27	1	13		
127	mallavva NAGAREDDI	F	48	160664	Non-mass	1.6	29	13	2	24	89	118	95	15	2	34	19	1	22	2	11		
128	Husanappa Halagani	M	32	133118	Massive	2.3	28	12	6	24	132	81	54	8	1	64	8	3	37	2	24	No	
129	Vaishnavi koli	F	45	155510	Non-mass	1.65	30	12	3	24	85	124	97	16	2	36	19	1	22	1	8		
130	J B Malagi	M	43	446996	Non-mass	1.32	22	14	4	23	82	126	84	16	1	34	18	1	24	1	11		
131	mallamma	F	44	195276	Non-mass	1.23	31	11	1	22	92	110	83	14	1	33	19	1	24	2	7		
132	Sumitra Satihal	F	39	115307	Non-mass	1.54	23	13	1	22	85	116	90	15	1	32	17	1	23	1	12		
133	Maremma Waddar	F	85	195015	Non-mass	1.98	22	14	3	26	86	128	84	14	2	31	21	1	22	3	9		
134	Basappa Chittl	M	56	186864	Non-mass	2.3	30	13	1	22	88	122	83	16	1	35	18	1	23	1	18		
135	anil rathod	M	54	117001	Non-mass	1.65	23	13	2	21	90	122	90	15	2	32	19	1	22	3	12		
136	Shankarappa Kamatagi	M	64	186840	Non-mass	1.45	25	11	3	20	78	118	89	16	1	34	17	1	24	2	9		
137	Ningamma Walikar	F	49	186827	Non-mass	1.25	27	11	4	23	92	120	94	15	1	31	20	2	25	1	11		
138	Sachin Nadavinmani	M	54	181537	Non-mass	1.27	27	13	4	22	80	128	95	16	1	36	19	2	27	1	7		
139	Bheerappa Shirshyad	M	46	180716	Non-mass	1.1	29	14	4	22	79	110	86	15	1	31	21	2	24	3	12		
140	Sumitra Bidari	F	48	120307	Non-mass	1.29	26	12	3	26	88	122	89	14	1	33	20	2	22	2	9		
141	Khandappa Pujari	M	35	153019	Non-mass	1.45	28	12	3	26	91	118	94	16	2	32	18	2	24	1	7		
142	Manisha Ram	F	33	136245	Non-mass	1.36	22	13	1	25	76	120	95	15	1	31	19	2	28	1	11		
143	Annasabi Bisari	F	37	150530	Massive	1.25	32	14	6	25	125	69	60	7	2	60	5	3	33	2	23	No	
144	amtuta Pujari	F	64	137567	Non-mass	2.3	34	12	3	22	90	114	98	16	1	31	21	1	28	1	8		
145	Subhas Chavan	M	82	150519	Non-mass	0.87	24	11	1	23	84	116	83	14	2	35	23	1	24	3	10		
146	Devamma Pujari	F	69	149284	Non-mass	1.36	29	13	4	23	86	110	90	15	1	32	17	2	24	3	11		
147	Sanjeev Allagi	M	55	145956	Non-mass	1.25	33	13	2	24	87	116	84	6	2	32	17	2	28	2	7		
148	Shanthabhai Biradar	F	40	344968	Non-mass	1.48	22	13	3	24	89	128	97	14	1	32	20	1	27	2	12		
149	Sanju Bajabale	M	48	234910	Non-mass	2	29	14	1	22	84	126	84	14	1	31	19	1	24	2	9		
150	Kumar Rathod	M	47	346189	Non-mass	1.6	24	12	2	22	88	124	91	15	1	35	21	2	23	2	13		

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151	Shantabai hireamath	F	36	394679	Non-mass	1.5	22	12	3	26	91	110	97	16	1	32	17	2	24	1	13		
152	shwetha biradar	F	37	370490	Non-mass	1.5	31	14	2	23	78	116	84	15	1	34	21	2	22	3	12		
153	Suresh Patil	M	41	117231	Non-mass	2	23	13	2	22	81	128	85	15	1	31	20	1	24	1	11		
154	Devuba Manavar	M	44	89575	Non-mass	1.8	28	13	3	24	92	130	87	16	1	36	17	1	24	3	18		
155	Reshma Hamadagi	F	38	123618	Non-mass	1.4	22	14	2	24	92	125	88	15	1	34	18	1	23	2	12		
156	Channappa Shrigiri	M	33	161931	Massive	2.1	40	11	6	26	134	72	57	10	2	35	4	1	38	1	19	No	
157	Devraj Nala	M	53	126965	Non-mass	2.4	22	13	4	26	93	127	84	15	2	32	23	1	23	2	12		
158	Siddamma Girisagar	F	45	66388	Non-mass	2.5	30	14	1	20	92	129	86	14	2	34	19	1	24	1	11		
159	Basamma Naikodi	F	34	228147	Non-mass	1.4	23	12	1	23	88	128	89	14	2	33	20	1	28	1	7		
160	Chandaramma Managuli	F	88	208325	Non-mass	1.5	27	14	3	22	91	110	94	16	2	31	17	2	25	3	12		
161	Shankreppa Medegar	M	55	282773	Non-mass	1.3	30	13	1	23	88	116	89	16	2	34	21	2	23	3	11		
162	Mahadev Devarnavadagi	M	43	205229	Non-mass	1.3	24	13	4	22	92	128	93	14	1	33	23	1	23	2	7		
163	Gaurabhai Gudimani	F	47	233494	Non-mass	1.5	32	14	2	22	80	122	95	16	1	31	17	1	22	1	9		
164	Sharanappa Madar	M	34	255136	Massive	1.6	32	13	6	22	129	79	66	6	1	57	5	1	37	1	20	Yes	
165	Ashwini Mathapati	F	32	138169	Non-mass	2.1	28	12	3	25	94	122	82	14	1	34	20	1	22	1	10		
166	Chandrashekhar Gulabal	M	46	14945	Non-mass	1.5	27	13	3	26	84	118	97	14	1	35	18	1	22	1	11		
167	sanjay rathod	M	47	12146	Non-mass	1.5	32	12	1	26	86	110	84	16	2	32	19	1	24	1	7		
168	Vaishali Wagamode	F	60	376037	Non-mass	1.6	23	14	2	24	88	116	85	15	1	32	17	2	23	1	12		
169	Bisamila Mujavar	F	54	243312	Non-mass	2	29	13	1	24	91	128	92	14	1	32	18	2	22	1	18		
170	Babagouda Patil	F	45	124627	Non-mass	1.5	33	14	2	23	91	122	90	15	1	34	18	2	27	1	13		
171	Dulappa Magari	M	55	388343	Non-mass	1	22	11	3	23	84	115	83	16	2	31	17	2	27	2	8		
172	Sharada Vikas Patil	F	52	093270	Non-mass	1	27	13	2	22	92	118	90	15	1	34	20	1	24	1	10		
173	RANGAPPA PUJARI	M	36	391751	Non-mass	1.4	29	14	1	22	82	128	84	14	2	33	19	1	23	3	11		
174	Poornima malipatil	F	45	393046	Non-mass	1.4	26	11	3	24	87	110	90	16	2	31	21	1	24	1	7		
175	Dulamma magari	F	48	305603	Non-mass	1.2	30	12	1	21	88	122	86	14	1	34	18	2	27	1	12		
176	sidamma madar	F	47	398411	Non-mass	1.5	28	11	3	22	90	118	89	14	1	31	19	2	22	3	9		
177	vaishnavi pujari	F	52	070658	Non-mass	1.6	22	14	2	25	80	115	94	15	1	36	18	1	24	3	13		
178	Shivappa Basappa Konnu	M	76	407313	Non-mass	1.2	24	12	3	25	90	127	83	15	1	34	19	1	22	2	7		
179	AJAYSING NAIK	M	35	411722	Non-mass	1.4	32	13	4	26	84	126	87	14	2	33	17	1	23	1	9		
180	RAJSHEKHAR TAMAV	M	45	411857	Massive	1.4	26	14	4	23	137	75	59	7	1	61	9	1	27	2	21	No	
181	kastturi chikkodi	F	65	013726	Non-mass	1.5	33	12	1	24	93	112	90	14	1	32	20	2	23	1	8		
182	SHAKUNTALA DEVAK	F	59	007376	Non-mass	1.4	26	11	4	25	82	122	91	16	2	31	17	1	23	1	9		
183	sanjay pawar	M	41	007333	Non-mass	1.5	34	13	2	22	78	118	83	16	2	35	21	2	27	1	9		
184	SHIVANGAUDA BIRAD	M	46	400448	Non-mass	1.4	24	14	3	24	74	117	87	14	2	32	18	2	24	2	13		
185	NEELAMMA YATGIRI	F	49	443952	Non-mass	1.5	29	13	1	26	88	126	88	15	2	34	19	1	22	2	12		
186	GURUMMA MATH	F	47	389525	Non-mass	1.5	33	12	2	22	90	128	92	16	1	31	17	2	24	2	11		
187	NAGAWWA ATHANUR	F	40	388263	Non-mass	1.4	22	13	2	23	77	110	88	15	1	36	20	1	24	2	18		
188	Rajaram Balasab	M	43	386938	Non-mass	1.4	29	11	3	22	90	116	97	14	1	34	19	1	22	2	12		
189	Shivappa Kalappa	M	48	386401	Non-mass	1.5	23	13	1	22	84	128	84	16	1	31	21	1	23	2	13		
190	Kashinath Jadhav	M	72	384046	Non-mass	1.6	30	11	3	21	86	124	82	15	1	31	20	1	22	1	8		
191	Basamma Shinde	F	45	059617	Massive	1.5	42	12	4	23	138	81	64	8	2	65	3	2	29	3	20		
192	Shantabai Teli	F	47	059603	Non-mass	2	28	12	3	23	87	127	96	16	1	34	17	1	22	1	11		
193	Siddappa kattimani	M	45	417978	Non-mass	1.3	22	14	1	22	78	128	86	15	2	35	20	1	24	1	8		
194	Bhimshi pujari	M	55	418755	Non-mass	0.87	30	13	3	27	84	110	89	16	2	32	19	2	23	1	9		
195	Kasturibai hittanalli	F	65	057189	Non-mass	1	23	12	4	22	92	112	94	15	1	31	21	2	4	2	12		

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