

The Impact of Alcohol Use Disorder on Blood Transfusion Outcomes in Trauma Patients

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Objectives

- Examine how alcohol use disorder (AUD) influences mortality rates, ICU admissions, length of hospital stays, and the number of blood transfusions received among trauma patients who received blood transfusions to quantify the impact of alcohol use on immediate clinical outcomes in the emergency department at the University Teaching Hospital of Kigali, Rwanda (CHUK).
- Analyze demographic data (age, sex, geographic residence) to determine if certain groups are more affected by alcohol use disorder in relation to trauma severity and clinical outcomes to identify vulnerable populations and inform targeted interventions.
- Explore the correlation between physiological markers such as prothrombin time, hemoglobin levels, and lactate levels with clinical outcomes to shed light on the biological mechanisms by which alcohol use disorder may exacerbate trauma-related complications.

Methods

This single-center prospective observational study focuses on trauma patients aged 16 and older receiving blood transfusions at the emergency department of the University Teaching Hospital of Kigali (CHUK ED).

- Research assistants approach patients with traumatic injuries shortly after admission for study enrollment.
- Participants provide informed consent and complete the AUDIT-C screening survey for alcohol use disorder, with both forms translated into Kinyarwanda.
- Collected data from participant health records includes age, sex, geographic residence (Kigali vs. non-Kigali), cause of trauma, injured body part(s), time and day of arrival, Glasgow Coma Scale (GCS) scores, intubation status, number, amount, timing, and cell types of blood transfusions received.
- Key outcomes include mortality, intensive care unit (ICU) admission, and length of stay (LOS) in the ED.

Background

Hypothesis: Trauma patients who receive blood transfusions in the emergency department and screen positive for Alcohol Use Disorder (AUD) are expected to exhibit a higher mortality rate, an increased likelihood of admission to the Intensive Care Unit (ICU), prolonged hospital stays, and more severe injuries necessitating greater volumes of transfused blood. This hypothesis is predicated on the assumption that individuals with AUD engage in more high-risk behaviors, which may result in poorer clinical outcomes.

Physiological Markers

The existing literature on the outcomes of trauma patients receiving blood transfusions, both with and without AUD, is notably limited. Concerning lactate levels, research has demonstrated that ethanol consumption is associated with elevated plasma lactate levels.^{1,2} Additionally, the current body of literature presents conflicting findings regarding prothrombin time (PT) in trauma patients diagnosed with AUD. While some studies suggest that alcohol consumption may prolong PT and impede clot formation,^{3,4} others assert that alcohol does not exert a significant effect on PT.⁵ Furthermore, prior investigations have indicated that hemoglobin levels tend to be lower in patients with moderate to severe alcohol use.^{6,7,8} However, the available data on the effects of alcohol use on lactate levels, prothrombin times, and hemoglobin levels within the context of blood transfusions in trauma patients is scarce.

Alcohol use disorders identification test– consumption (AUDIT-C) survey

Questions	Scoring system					Your score
	0	1	2	3	4	
How often do you have a drink containing alcohol?	Never	Monthly or less	2 - 4 times per month	2 - 3 times per week	4+ times per week	
How many units of alcohol do you drink on a typical day when you are drinking?	1 - 2	3 - 4	5 - 6	7 - 9	10+	
How often have you had 6 or more units if female, or 8 or more if male, on a single occasion in the last year?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	

In men, a score of 4 or more is considered positive, optimal for identifying hazardous drinking or active alcohol use disorders. In women, a score of 3 or more is considered positive. Generally, the higher the score, the more likely it is that a person's drinking is affecting his or her safety.⁹

Preliminary Results

- IRB approved on August 25, 2024.
- The Rwanda Ministry of Health announced the confirmation of Marburg virus disease, which can cause hemorrhagic fever, in patients in health facilities in the country on September 27, 2024.¹⁰ Most of the people infected are healthcare workers.¹⁰
- Three participants have enrolled in the study currently.

Future Directions

- Data collection will continue at CHUK until January 2025.
- Conduct quantitative analysis of data once collection is complete
- Submit article for publication

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