Pre-hospital measurement of Catecholamine levels in injured motorcycle riders

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Background and Rationale

Anecdotal experience from prehospital providers who attend injured motorcycle racers within minutes of an accident will often find the patient pale, clammy & with a difficult to palpate or absent pulse. This is often due to blood loss or other life threatening injury but in some cases will resolve with no treatment & no significant bleeding or injury found.

We propose that there is a significant release of catecholamines at the time of injury which result in severe vasoconstriction mimicking severe blood loss, injury or cardiac arrest.

We are in a fairly unique position in being able to attend severe trauma patients within minutes of their injury potentially allowing us to measure this.

Research Questions

Is there a large release of Adrenaline, Nor-Adrenaline & dopamine in a patient who has experienced significant traumatic injury.

Aims and Objectives

To measure the levels of Adrenaline, Nor-Adrenaline & dopamine in motorcycle racers who have been injured, within the first few minutes and compare it with levels on arrival to the Emergency department. We will also compare it to Injury severity score (ISS)

Study Design and Methods

Study Design

This will be a quantitative single centre pilot study.

Participants

Will be Competitors in the 2025 Isle of Man TT who are injured during a race or practice session & require in intravenous cannula (IV). They will be consented on arrival to the emergency department or at a later date if unable to consent due to their injuries. We plan to recruit approximately 20 riders based on previous years.

Methods of Measurement

Blood samples with be obtained at the time of IV insertion and again when routine blood samples are taken on arrival in the Emergency department. These will be processed at Noble's hospital & the results retained on the ICE system.

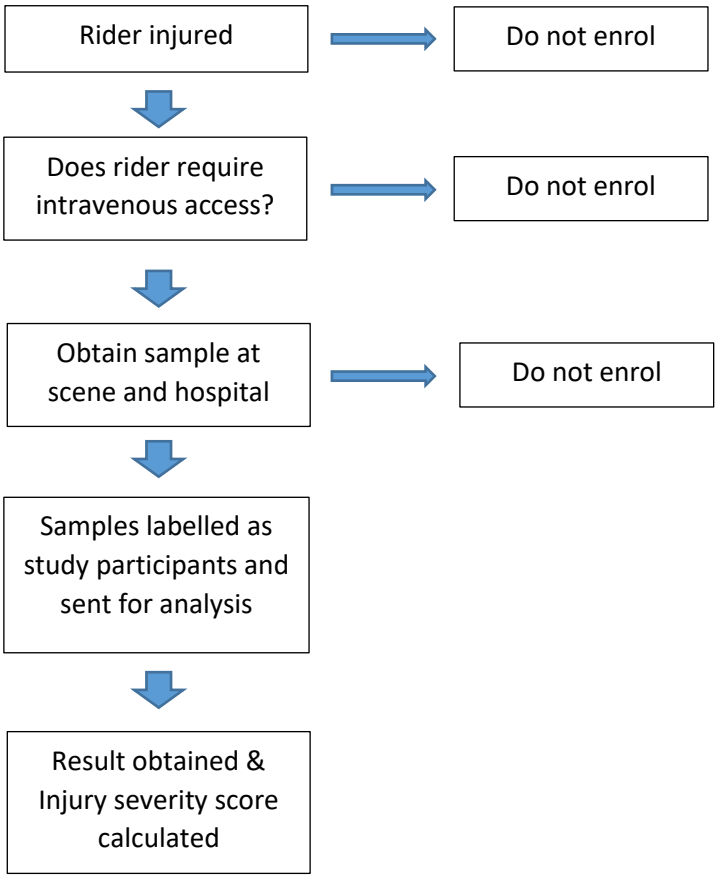
Each patient will be given an ID number & this number will be used for processing data once the results have been obtained.

Outcome Measures

Primary outcome – are catecholamine levels higher on the initial measurement

Secondary outcome – are the levels relatable to severity of injury

Flowchart



Ethical Considerations

Ethical considerations include the difficulty in obtaining consent from patients who are severely injured or may have died.

Risks to prehospital staff who may be working in difficult & dangerous situations are felt to be no different from those they would undertake as part of their normal role.

There will be no change in treatment for patients enrolled in the study & those who decline to participate.

All information containing patient identifiable information will be stored securely on Manx care computers or locked folders at Noble's Hospital. The data will only be accessible to appropriately trained members of the research team

Costing

Apart from the cost of consumables and the biochemical analysis there are expected to be negligible costs. Data processing & presentation of results will be prepared by the research team in their own time.

Timescales

Due to the time constraints placed by Racing we will plan to start the study on 26th May & complete sample collection by 8th June. We aim to have completed the data collection & processing by mid July 2025 & will put out to publication if suitable in early autumn 2025.

Dissemination

We plan to submit a paper to a suitable Emergency medicine or prehospital care journal.

Copies of any papers will be forwarded to participants & the results shared at Riders meetings & the local Trauma forum.