

In-vitro haemolysis rates in the Emergency Department in a London teaching hospital

S Sardiwal, K Bates, R P Vincent

Dept of Clinical Biochemistry, King's College Hospital NHS Foundation Trust, London

Introduction:

In-vitro haemolysis is the leading source of pre-analytical error, accounting for 40-70% of unsuitable samples¹.

Several publications have identified hospital Emergency Departments (EDs) as a major source of haemolysed samples².

Reducing the rates of *in-vitro* haemolysis would improve patient care by decreasing the number of cancelled results, improving turnaround times and reducing unwarranted variation.

Aim:

The aim of this audit was firstly to establish the number of haemolysed samples (defined as H index ≥ 100 mg/dL Hb) received from ED at King's College Hospital; Secondly to perform a blood collection audit in ED using 5 different members of staff and 5 different patients. For this audit the following standards were applied:

- National Patient Safety Agency Assessment criteria for obtaining a venous blood sample³
- Greiner Vacuette guidelines and instructions for venous blood collection⁴
- WHO guidelines on drawing blood: best practices in phlebotomy⁵

Results:

Figure 1: Percentage of samples showing a haemolysis index (HIDX) of ≥ 100 during July 2020 by location.

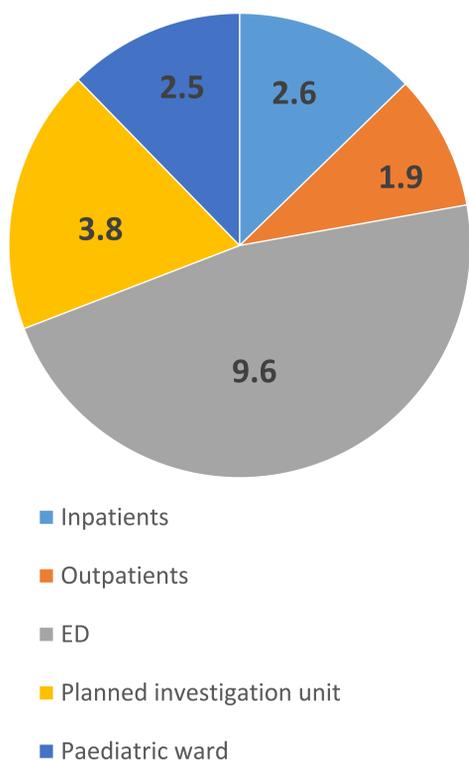


Figure 1 shows that ED had $\geq 2.5x$ higher incidence of haemolysis vs. other locations. The July percentage of samples with H index ≥ 100 in ED was 9.6% (2020 average 8.8%) vs. 2.5% for inpatients.

Although the American Society for Clinical Pathology has set the benchmark of best practice at a haemolysis rate of 2%⁶ other published haemolysis rates for ED departments range from 6.8-19.8%².

Non-conformances were observed from the blood collected from 5 out of 5 patients:

- Correct order of draw not followed (3/5)
- Samples not appropriately mixed (3/5)
- Tourniquet in place for extended periods of time (3/5)

However, only one of these samples had results cancelled due to haemolysis.

Recommendations:

- Display order of draw posters in ED
- ED to remind staff on correct phlebotomy procedure and introduce sessions for junior doctors arriving in the department
- Phlebotomy to share with ED competencies for blood taking and an instructional video
- Lab to produce monthly ED haemolysis rates for ED staff to monitor improvement

Current progress:

Haemolysed samples in ED have a current lower 2021 average of 7.9% (Jan-Aug 2021).

Although a slight improvement, this is still a much higher incidence of haemolysis than other areas of the trust. Figure 2 shows that ED still have quite a variety in haemolysis rates.

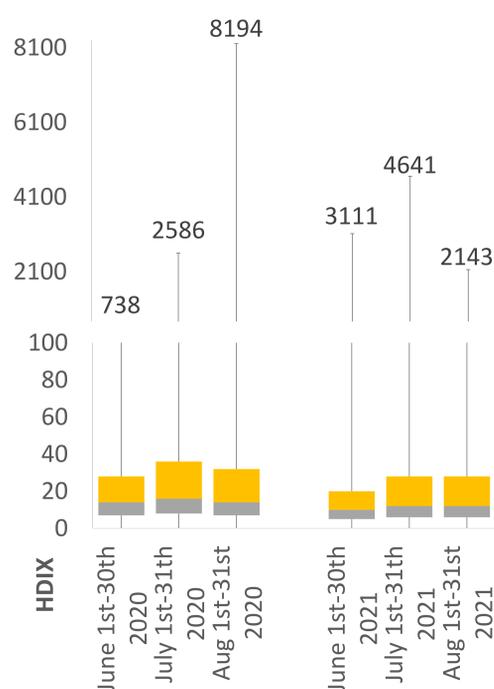


Figure 2: Box and Whisker plot to show haemolysis index (HIDX) of all samples in ED 2020 vs 2021

Conclusions:

- *In-vitro* haemolysis is generally preventable
- Clinical laboratories need to work together with hospital departments in developing effective practices to reduce haemolysis rates and improve pre-analytical standards and patient care

References:

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