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Fibrinogen Deficiency in Prehospital Trauma: A Retrospective Review of Patients Retrieved by CareFlight Rapid Response Helicopter

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Background and rationale

Fibrinogen deficiency and haemostatic failure: what we already know

What we know

1. **An early, critical driver in ATC**
2. **Consistently linked to worse outcomes**
3. **Concentrate corrects it, fast**

What the research shows

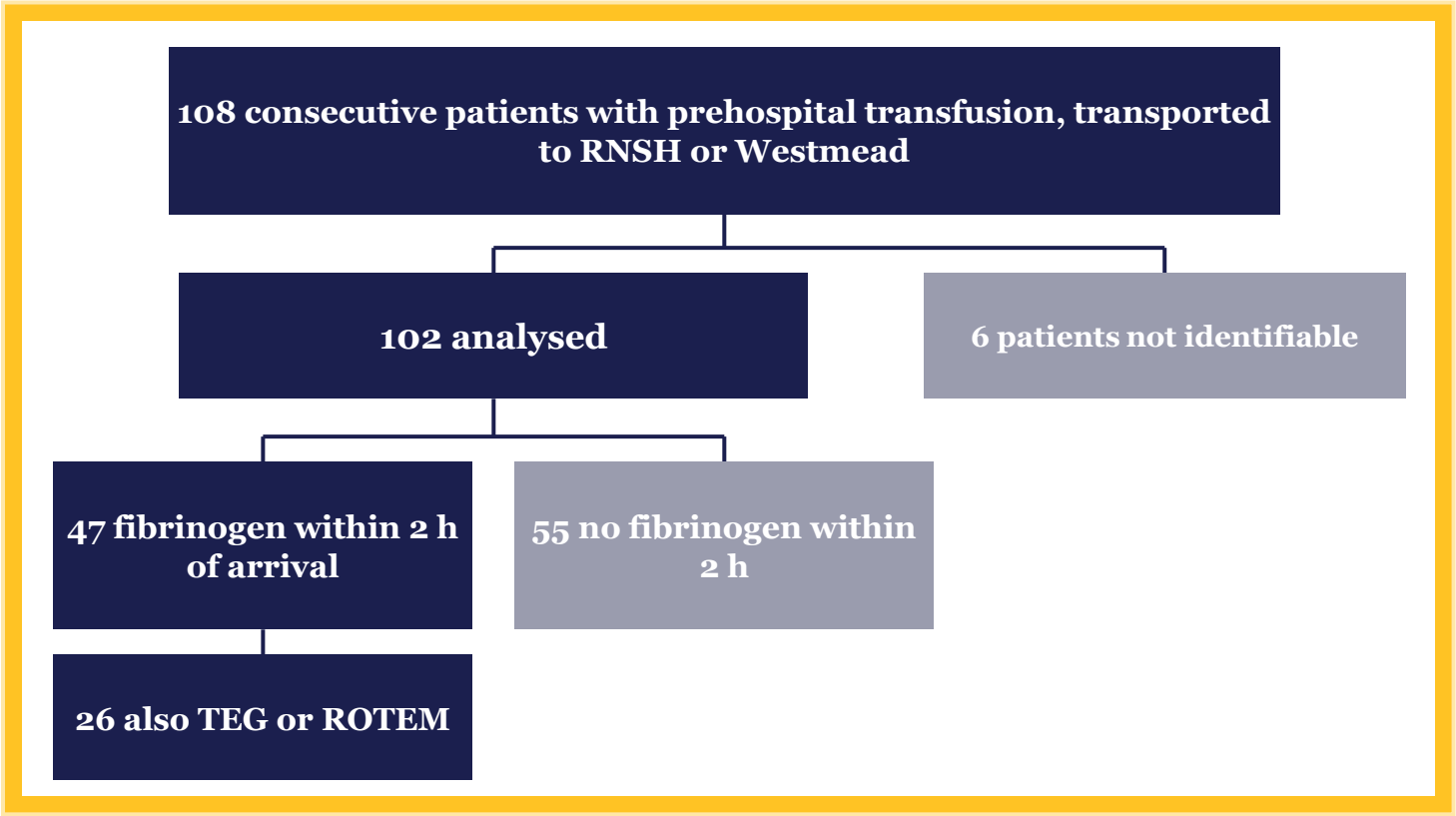
1. **Empirical replacement doesn't reliably help**
2. **Evidence favours targeted replacement**
3. **Viscoelastic testing as the tool**

What we don’t know

1. **The incidence is unknown**
2. **The patient profile is unknown**
3. **The natural history is unknown**

Study Design

Retrospective audit | 108 consecutive patients | 2021 to 2025 | Westmead and Royal North Shore Hospital



Median age 42

82% male

(82/102)

78% blunt

(80/102)

83% TXA

(85/102)

46% severe shock

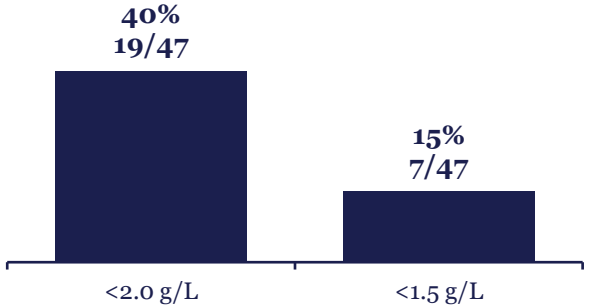
shock index ≥1.4, including arrest and unrecordable BP (47/102)

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CRRH is a prehospital retrieval service tasked to trauma primaries. Fibrinogen valid only if within 2 h of hospital arrival. Both sites shown together.

Results

How common? Fibrinogen on arrival

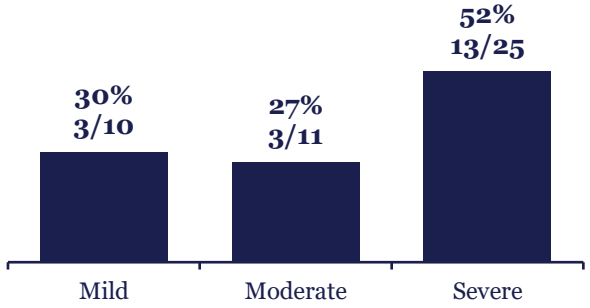


40% <2.0 g/L

95% CI 28 to 55

Median 2.1 g/L; 55 of 102 not tested

Who? % <2.0 g/L by shock index



pH 7.10 vs 7.27

p=0.003

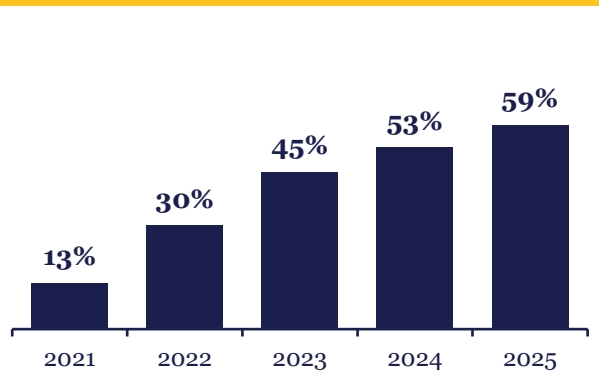
BE -9.9 vs -2.0

p=0.012

Lactate 6.6 vs 3.9

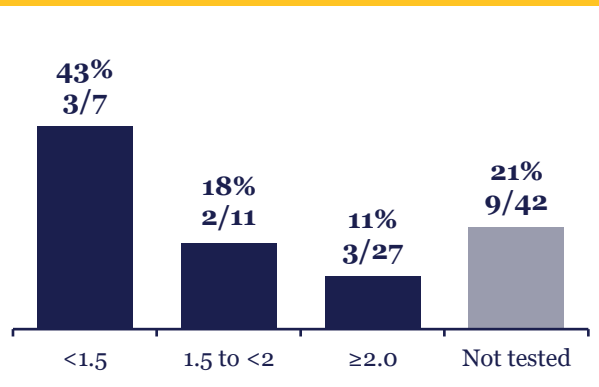
p=0.047

Testing: TEG/ROTEM result by year



Increasing uptake

Outcome: in-hospital mortality



28% vs 11%

<2.0 vs ≥2.0 g/L, p=0.24

pH <7.2: 35% vs 6%, p=0.001

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Fibrinogen within 2 h of arrival (n=47); outcomes n=87 with known outcome; sites combined. Exploratory, unadjusted; fibrinogen in g/L.

Conclusions: what we found against our aims

Incidence

About 4 in 10 (19/47, 40%) had fibrinogen <2.0 g/L on arrival, and 15% were <1.5 g/L

Patient profile

Lower arrival pH and base excess and higher lactate were linked to deficiency; severe shock trended higher. Age, mechanism, TXA, units given and prehospital times were not

Natural history

Mortality 28% vs 11% with fibrinogen <2.0 vs ≥2.0 g/L (p=0.24); acidosis was the stronger signal (35% vs 6%)

Next step

Prospective prehospital fibrinogen measurement, and whether targeted replacement improves outcomes

Limitations

Retrospective, small numbers

Fibrinogen in under half (47/102)

Viscoelastic results may be unlinked

Unadjusted, exploratory tests