

Anaemia After Subarachnoid Haemorrhage Predicts Higher Mortality and Morbidity

SQA21

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INTRODUCTION

Subarachnoid haemorrhage (SAH) is an acute cerebrovascular accident that causes morbidity and mortality.¹ It often results in intensive care (ICU) admission for neuroprotection and prevention of secondary insults.² Anaemia can reduce cerebral oxygen delivery and accentuate mortality and morbidity. Current recommendations target haemoglobin (Hb) of 80-100 g/L in patients with SAH.³ Anaemia was defined as Hb \leq 95g/L, and severe anaemia as Hb \leq 80g/L.

AIMS

To investigate mortality and morbidity outcomes associated with anaemia after SAH
 Primary outcome: Modified Rankin Scale score at 28 days.
 Secondary outcomes: delayed neurological deficits, length of stay in ICU, death in ICU and number of days to death.

METHODS

Retrospective study of patients with SAH at the Queen Elizabeth Hospital, Birmingham, between January 2016 and August 2019.
 •Patients were included if they were \geq 18 years old and had suffered SAH.
 •Patients were excluded if they had concurrent haematological malignancies.
 Data collected on baseline characteristics, World Federation of Neurosurgical Societies SAH grade, secondary insults such as occurrence of hypoxia, anaemia and hydrocephalus, and units of blood transfused.

RESULTS

24% (n=169) of patients had anaemia, and 12% had (n=83) severe anaemia. The incidence of anaemia after SAH was associated with increased risk of death or severe disability (modified Rankin scale 4-6 Kendall's tau-b=-0.37, p<0.001). It was also associated with worse survival outcomes (p<0.001) and increased length of stay in ICU (p<0.001). (Fig 1&2)
 25.1% (n=52) of patients with anaemia were given blood transfusion. Average Hb at transfusion was 77.4g/L (standard deviation 9.25; CI 2.52; p<0.05).

OUTCOMES

PRIMARY: Modified Rankin Scale (at 28 days)

0	No symptoms
1	No significant disability despite symptoms
2	Slight disability but able to carry out ADLs
3	Moderate disability but able to walk independently
4	Moderately severe disability; unable to attend to bodily needs independently
5	Severe disability; bed-bound
6	Death

SECONDARY: Length of stay in ICU

Death in ICU

Secondary insults eg. anaemia, hypoxia

DISCUSSION

- Development of anaemia in SAH is associated with mortality and morbidity (Modified Rankin Scale > 4), which prolongs recovery and places burden on rehabilitation.
- Improvements in prevention and earlier treatment of anaemia after SAH would enhance patient care and recovery. and be of clinical benefit.
- Earlier transfusion might decrease risk of disability and net spending; the average cost of a blood transfusion in the NHS is £170.14 while the average per patient cost for SAH is £23,294, which includes rehabilitation and follow-up.⁴

CONCLUSION

Anaemia is a recognised complication after SAH and is associated with a significant increase in risk of death and severe disability. These results indicate that haemoglobin in patients with SAH should be monitored closely and corrected (if Hb<95g/L) and can guide further study into the causative effect between anaemia and increased mortality and morbidity.

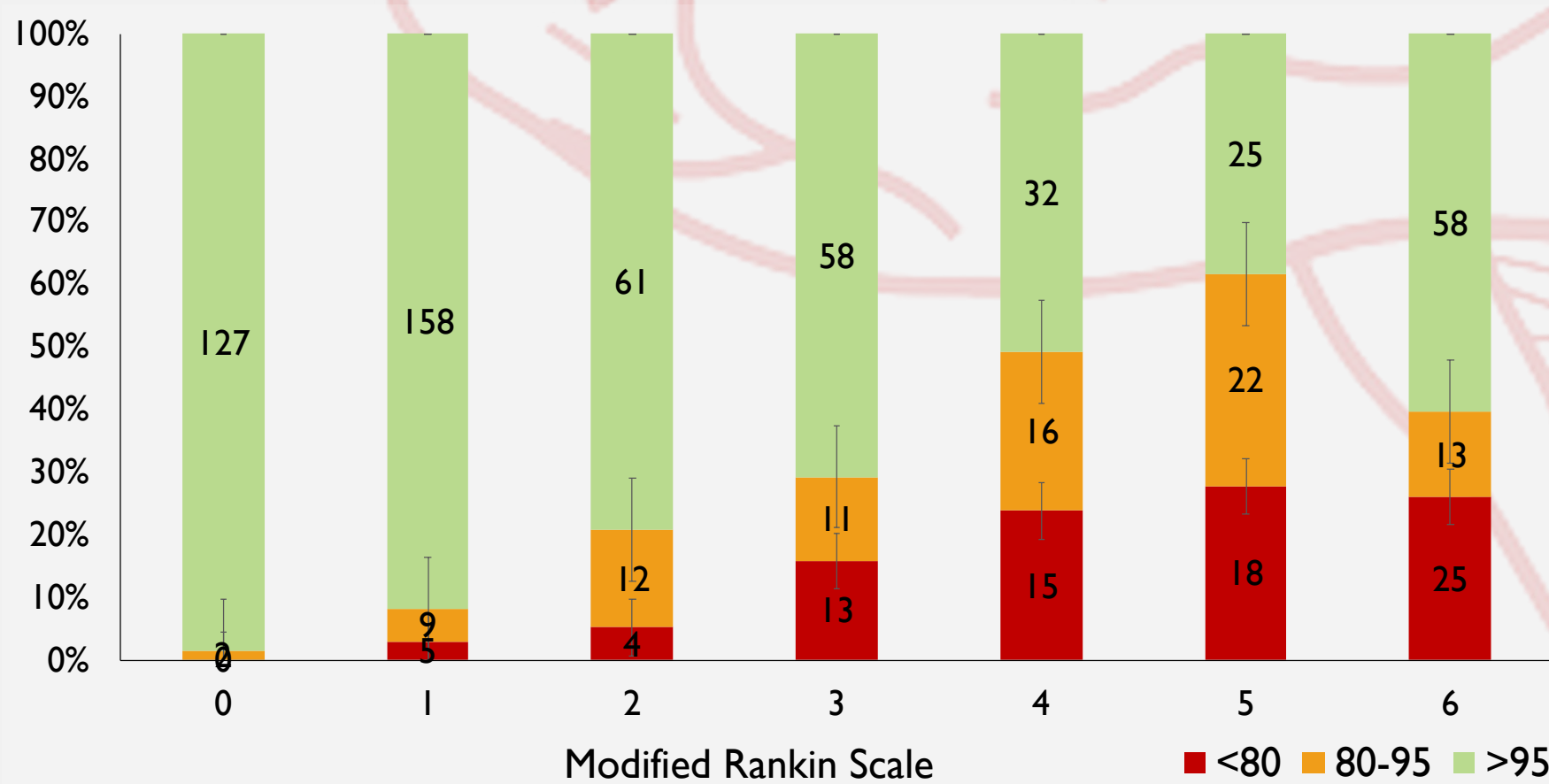


Fig 1. There is considerable correlation (Kendall's tau-b= -0.37, p<0.001) between severity of anaemia and higher Modified Rankin Scale score

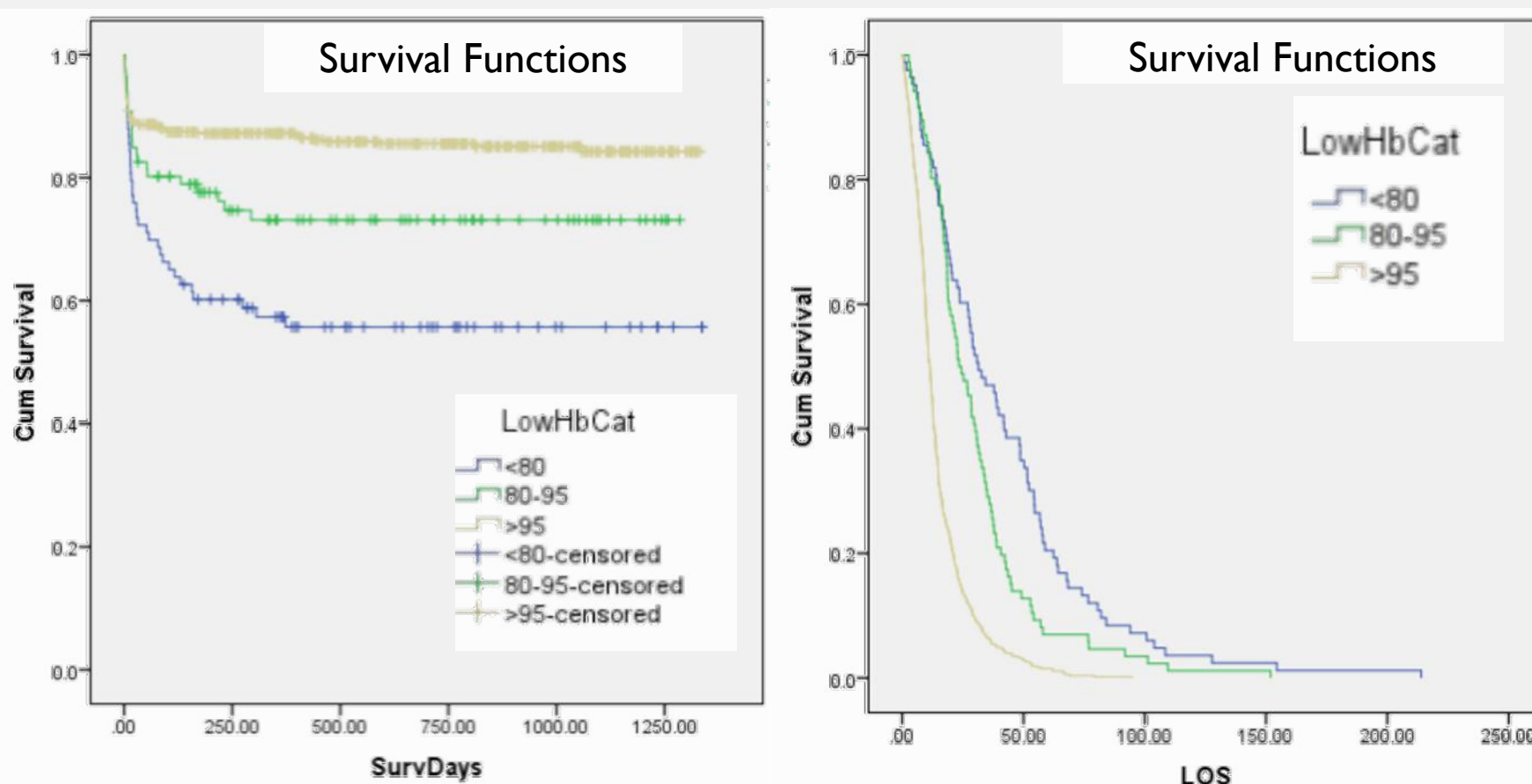


Fig 2. Anaemia after SAH is associated with decreased survival and increased LOS in ICU (p<0.001)

References

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