

Lack of follow-up of anaemia after discharge from an upper gastrointestinal bleeding centre

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ABSTRACT

INTRODUCTION: Acute upper gastrointestinal bleeding is common and anaemia at discharge also occurs frequently. Follow-up studies of patients after discharge are limited. Furthermore, guidelines for follow-up and treatment of post-discharge anaemia have not been published.

MATERIAL AND METHODS: We performed a local, retrospective evaluation of patients admitted for acute upper gastrointestinal bleeding.

RESULTS: The retrospective evaluation found that more than 80% of the patients admitted for acute upper gastrointestinal bleeding were discharged with apparent anaemia, and oral iron supplementation was recommended for 16% of the discharged anaemic patients. Our study revealed no standardised follow-up protocols for anaemic patients.

CONCLUSION: The follow-up practice for patients with anaemia was inconsistent. Based on our research, well-designed studies are needed to determine the most effective post-discharge treatment for patients who are still anaemic at discharge after endoscopic treatment of acute non-variceal upper gastrointestinal bleeding.

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Anaemia after acute upper gastrointestinal bleeding (AUGIB) is common. AUGIB is defined as an acute upper gastrointestinal bleeding (or haemorrhage) originating proximally to the ligament of Treitz; in practice from the oesophagus, stomach and duodenum [1]. Follow-up studies of patients admitted with non-variceal AUGIB are limited, but have revealed that more than two-thirds of the patients diagnosed with anaemia prior to discharge recovered from the anaemia after a period of two to 144 months [2-5]. As AUGIB is a common disorder, post-discharge anaemia is widespread [6-8]. Guidelines for endoscopic treatment of AUGIB have been developed [1, 9]. Unfortunately, no studies or guidelines on post-discharge anaemia following the endoscopic intervention of non-variceal AUGIB can be identified by systematic literature review. The national guidelines and recommendations in Denmark for AUGIB do not cover the aspects of anaemia post-discharge [10, 11].

Studies investigating the quality of follow-up and the duration of post-discharge anaemia in relation to iron replacement therapy are still outstanding. The aim

of the present study was to investigate the quality of follow-up, the prevalence and the duration of anaemia after non-variceal AUGIB treatment in a Danish cohort of patients.

MATERIAL AND METHODS

All patients who had been admitted to Aarhus University Hospital in Denmark for observation for non-variceal AUGIB during an eight-month period in 2009 were included in the initial patient screening ($n = 264$). A total of 95 patients were excluded at screening because they did not have non-variceal AUGIB. The study is a retrospective analysis of 169 patients who had AUGIB upon admittance in 2009 and who had a post-discharge follow-up for two years.

All of the patients included in the study were admitted to the semi-intensive care unit (SICU) at Aarhus University Hospital in Denmark for post-treatment observation for approximately three days after the endoscopic intervention of the non-variceal AUGIB.

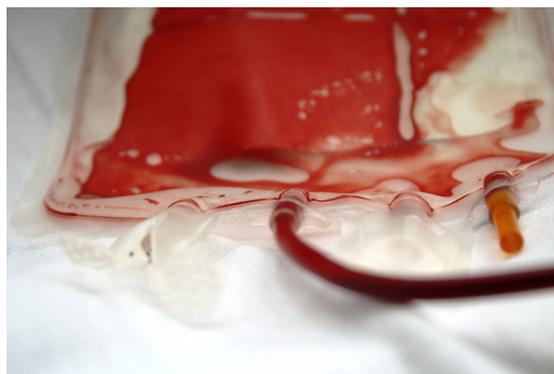
Our data were obtained from patient medical records and electronic databases, which included the following data: gender, age, endoscopic findings, haemoglobin levels, treatment for post-endoscopic anaemia, time until the haemoglobin levels returned to the normal range and mortality. Descriptive statistics are used to report our findings.

The World Health Organization (WHO) definition of anaemia was used to diagnose anaemia in all of the patients. Anaemia was diagnosed if the haemoglobin levels

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Acute upper gastrointestinal bleeding is associated with anaemia and the follow-up practice post-discharge is inconsistent.

were less than 13 g/dl in males or less than 12 g/dl in non-pregnant females [12].

Because the follow-up data for several patients were incomplete and scattered, we used the last observation carried forward (LOCF) to determine whether the patient had anaemia.

Trial registration: not relevant.

RESULTS

A total of 169 patients were included in our retrospective analysis. All of the patient demographic data were available, but comprehensive follow-up data were generally insufficient and incomplete.

The patients' demographic data are summarised in **Table 1**. Approximately half of the patients were males, and the median patient age was 70 years (range 22-95 years). The most common cause of non-variceal AUGIB was peptic ulcer (50%), which was followed by "no findings" (22%) and oesophagitis (15%). Of the 22% with "no findings", 25% (n = 9) subsequently had a colonoscopy performed. In six cases, polyps or diverticles were identified.

84% of the patients were discharged from the semi-intensive care unit with anaemia.

The prevalence of anaemia in the patients who were discharged from the SICU to their homes was 82%. Among these patients, only 16% were advised to take an iron supplement after discharge.

A total of 27 of the 169 patients with non-variceal AUGIB enrolled in the study were non-anaemic at the time of their discharge and were not included in our analysis (**Figure 1**).

Of the 142 patients with post-discharge anaemia, 57 had no follow-up data, which left 85 patients for further investigation of the length of the anaemic period after discharge from the SICU.

Three patients received blood transfusions (two units of SAGM red blood cells each) following discharge. For this very small group, the median period until achieving "no anaemia" was less than one month. The eighteen patients who were advised to take an iron supplement had a median period of four months until achieving "no anaemia". The remaining patients (n = 64) received neither a blood transfusion nor advice to take an iron supplement. This group had a median period of two months until reaching the "no anaemia" stage.

The median haemoglobin levels at discharge were lower in the patients who were advised to take an iron supplement than in the patients who were not advised to take an iron supplement.

Additional analyses were performed to estimate the incidence rate (IR) of progression from the state of "anaemia" to the state of "no anaemia". The IR considered all of the patients who were alive and had anaemia at discharge to assess their time spent at risk. The LOCF was used to determine whether a patient had anaemia. The results of the IR calculation were similar to the median findings displayed in **Figure 1**: four months until recovery for the patients who were recommended oral iron supplementation and two months until recovery for the patients who were not recommended oral iron supplementation.

DISCUSSION

Our retrospective study found that 84% of patients treated for non-variceal AUGIB had anaemia at the time of discharge from the SICU. Several patients were relocated to a regular ward before their final discharge from the hospital. Approximately one-third of the patients were discharged from the SICU directly to their home with anaemia, of which only 16% were recommended oral iron supplementation.

The patients with anaemia who were recommended oral iron supplementation had lower haemoglobin levels than patients who were not recommended oral iron supplementation. Unexpectedly, the median time of progression from "anaemia" to "no anaemia" was four months for patients who were recommended oral iron, but only two months for patients who were not recommended oral iron supplementation.

The difference in the median time of progression from "anaemia" to "no anaemia" may be due to differ-

TABLE 1

Demographics, disease characteristics and status of anaemia among 169 patients with non-variceal acute upper gastrointestinal bleeding.

Males, n (%)	86 (51)
Age at time of admission, years, median (range)	70 (22-95)
<i>Endoscopic findings, n (%)</i>	
Peptic ulcer	85 (50)
No findings	37 (22)
Oesophagitis	25 (15)
Gastritis	10 (6)
Dieulafoy's lesion	6 (4)
Cancer	3 (2)
Mallory-Weiss tear	3 (2)
B haemoglobin conc. at admission, g/dl, median (IQR) [range]	10.0 (8.2-12.2) [4.2-17.4]
B haemoglobin conc. at discharge from SICU, g/dl, median (IQR) [range]	10.6 (9.5-11.8) [7.4-16.8]
Anaemia ^a at discharge from SICU, overall, n (%) [CI]	142 (84) [78-90]
Iron supplement recommended, if anaemia, at discharge from SICU, overall ^b , n (%) [CI]	25 (18) [11-24]
Anaemia ^a at direct discharge from SICU to home ^c , n (%) [CI]	56 (82) [73-92]
Iron supplement recommended, if anaemia, at directly discharge from SICU to home ^d , n (%) [CI]	9 (16) [6-26]

CI = 95% confidence interval; IQR = interquartile range; SICU = semi-intensive care unit.

a) Haemoglobin < 12 g/dl for non-pregnant females, haemoglobin < 13 g/dl for males;

b) N = 142; c) N = 68; d) N = 56.

ences in the initial haemoglobin level between the two groups. However, the difference may also be due to a low rate of adherence to oral iron treatment. In a follow-up study on the outcomes of patients with iron-deficient anaemia after endoscopic examination of the upper and lower GI tract, Schilling et al showed that 68% of the patients recovered from anaemia after oral iron treatment; unfortunately, the follow-up period and the rate of adherence to the oral iron regimen were not clearly described. Furthermore, their investigation did not analyse patients who suffered from acute blood loss [5].

Not surprisingly, the patients in our study who received blood transfusions after discharge from the SICU had the shortest median time of progression to "no anaemia". Although blood transfusions are effective and obvious treatments for anaemia, they have also been associated with an increased mortality risk for patients with AUGIB [13].

40% of the anaemic patients in our study had no follow-up data for the two-year follow-up period. Whether the missing follow-up data represent a health problem for the patients is unknown. But it is clear that despite a professional and evidence-based treatment, the long-term outcome regarding anaemia is unknown for a large minority of patients.

For those with available follow-up data, certain data were sporadic and other data had a scattered chronological pattern, which indicates that a systematic follow-up protocol for anaemic patients was not established for these patients. This may be due to the lack of guidelines on post-discharge anaemia management. As guidelines are mainly based on published investigations, the lack of guidelines may start there.

Investigations monitoring long-term outcomes regarding anaemia and studies exploring the potential effect of iron supplementation on anaemia in AUGIB patients following discharge are therefore needed.

In conclusion, our retrospective study found that more than 80% of patients with non-variceal AUGIB had anaemia at the time they were discharged, and only 16% of these patients were recommended oral iron supplementation. The follow-up practice for patients with anaemia was inconsistent. Based on our research, well-designed studies are needed to determine the most effective post-discharge treatment for patients still anaemic at discharge after endoscopic treatment of acute non-variceal upper gastrointestinal bleeding.

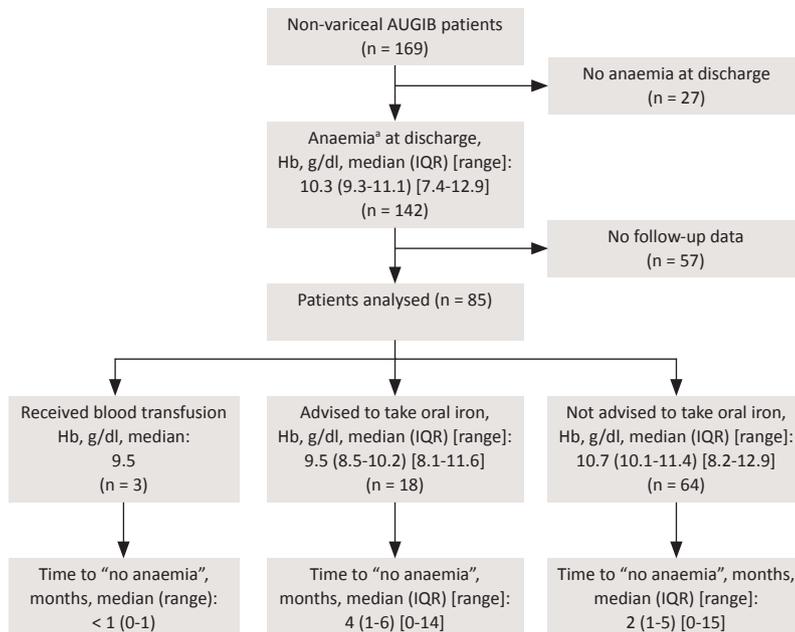
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FIGURE 1

Patients discharged after non-variceal acute upper gastrointestinal bleeding (AUGIB) from semi-intensive care unit. Flow chart of participants, including levels of haemoglobin at discharge and time to "no anaemia".



Hb = haemoglobin.

IQR = interquartile range.

a) Haemoglobin < 12 g/dl for non-pregnant females, haemoglobin < 13 g/dl for males.

LITERATURE

1. Scottish Intercollegiate Guidelines Network. Management of acute upper and lower gastrointestinal bleeding. A national clinical guideline. Edinburgh: Scottish Intercollegiate Guidelines Network, 2008.
2. Gordon S, Bensen S, Smith R. Long-term follow-up of older patients with iron deficiency anemia after a negative GI evaluation. *Am J Gastroenterol*. 1996;91:885-9.
3. Rockey DC, Cello JP. Evaluation of the gastrointestinal tract in patients with iron-deficiency anemia. *N Engl J Med* 1993;329:1691-5.
4. Sahay R, Scott BB. Iron deficiency anaemia - how far to investigate? *Gut* 1993;34:1427-8.
5. Schilling D, Grieger G, Weidmann E et al. Long-term follow-up of patients with iron deficiency anemia after a close endoscopic examination of the upper and lower gastrointestinal tract. *Z Gastroenterol* 2000;38:827-31.
6. Lassen A, Hallas J, Schaffalitzky de Muckadell OB. Complicated and uncomplicated peptic ulcers in a Danish county 1993-2002: a population-based cohort study. *Am J Gastroenterol* 2006;101:945-53.
7. Targownik LE, Nabalamba A. Trends in management and outcomes of acute nonvariceal upper gastrointestinal bleeding: 1993-2003. *Clin Gastroenterol Hepatol* 2006;4:1459-66.
8. van Leerdam ME, Vreeburg EM, Rauws EA et al. Acute upper GI bleeding: did anything change? Time trend analysis of incidence and outcome of acute upper GI bleeding between 1993/1994 and 2000. *Am J Gastroenterol* 2003;98:1494-9.
9. British Society of Gastroenterology Endoscopy Committee. Non-variceal upper gastrointestinal haemorrhage: guidelines. *Gut* 2002;51(suppl 4):iv1-iv6.
10. Blødende gastroduodenalt ulcus. Tværfaglig national klinisk retningslinje for diagnostik, behandling og pleje. Det Nationale Indikatorprojekt, 2010. www.nip.dk (22 Jan 2013).
11. Laursen SB, Jørgensen HS, Schaffalitzky de Muckadell OB. Behandling af blødende gastroduodenale ulcera. 2011. www.kirurgisk-selskab.dk (22 Jan 2013).
12. WHO/UNICEF/UNU. Iron deficiency anemia: assessment, prevention and control. Report of a joint WHO/UNICEF/UNU consultation. Geneva: World Health Organization, 1998.
13. Taha AS, McCloskey C, Craigen T et al. Mortality following blood transfusion for non-variceal upper gastrointestinal bleeding. *Frontline Gastroenterol* 2011;2:218-25.