



Blood transfusion strategy in cirrhotic patients with active upper GI bleeding

Vishnu Prasad Nelamangala Ramakrishnaiah¹, Vijayakumar Chellappa¹, Mangala Goneppanavar²

¹Unit-IV—HPB Surgery, Department of Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry, India; ²Department of Pathology, Mahatma Gandhi Medical College and Research Institute (MGMC & RI), Pillayarakuppam, Puducherry, India

Correspondence to: Prof. Vishnu Prasad Nelamangala Ramakrishnaiah. Unit-IV—HPB Surgery, Department of Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry, India. Email: vprasad285@gmail.com.

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Upper gastro intestinal bleeding (UGIB) in patients with cirrhosis is a major medical problem in the emergency department. It was found to be the common cause for UGIB in our institute seen in nearly 36% of patients. The other common causes for the UGIB were peptic ulcer disease and erosive mucosal disease. It was also an important indication for resuscitation and blood transfusion, nearly 65% of such patients received blood transfusion (1). On a multivariate analysis, using logistic regression, multiple blood transfusions were one of the factors associated with mortality in these patients in our tertiary care institution (1). Hence, it is important to follow a safe and effective blood transfusion strategy in patients with UGIB, for a better outcome.

In the iMDT corner of *AME Medical Journal*, a case report of UGIB in a cirrhotic patient due to hepatitis B virus was discussed recently (2). In the management of this patient, a liberal blood transfusion strategy was followed; blood transfusion was given, even though the initial hemoglobin was 12.8 g/dL to avert a possible shock state. It could be seen that a liberal transfusion policy of transfusing packed red blood cells (PRBC) and fresh frozen plasma (FFP) led to repeated episodes of bleeding in that patient and bleeding came under control only when Hb% was 7.7 g/dL. In the discussion part of the article several important questions like restrictive *vs.* liberal transfusion strategy, need of transfusion in the presence of deranged clotting mechanism in cirrhotics, hemoconcentration in the setting of UGIB and the number of units of transfusion necessary were raised and finally, it was concluded that restricting blood transfusion is the way forward. Keeping this in mind,

we would like to re-emphasize some of these facts below.

There is a significant improvement in the understanding of coagulopathy in cirrhotic patients recently (3,4). We now know that both pro-coagulant and anti-coagulant factors are decreased in these patients and hemostatic balance is maintained at a low level. They are susceptible to both hemorrhage and thrombosis (5). Thrombin generation time gets impaired in these patients if the platelet count falls below $50 \times 10^9/L$ (6).

Use of prothrombin time test is not found to be useful for prophylactic transfusion of FFP in these patients (7). Hence, thromboelastography (TEG) guided blood products transfusion may be useful in the future (8). Drugs that produce hemostasis have a limited role either in the prevention or treatment of bleeding in cirrhotics since the main reason for bleeding is due to portal hypertension and altered hemodynamics (9).

In the randomized study of Villanueva *et al.* transfusion of RBCs with a liberal strategy (Hb% <9 g/dL) was associated with a worse outcome in patients with acute UGIB and the same was true also in the subgroup of cirrhotic patients with Child-Pugh class A and B. This could be probably due to further increase in portal pressure and hence further bleeding (10). A restrictive transfusion strategy (Hb% < 7 g/dL) was associated with a reduced rebleeding, decreased adverse events and an improved survival compared with a liberal strategy. In the non-inferiority randomized controlled trial in our institute, restrictive transfusion did not increase the mortality, morbidity, re-bleeding rates and the need for interventions when compared to liberal

transfusion strategy (11). Galal *et al.* found that, among the Egyptian patients with variceal bleeding, the restrictive strategy of blood transfusion was better with respect to the complication, hospital stay and mortality (12). Chen *et al.* in their propensity matched retrospective study of a very large group of patients with UGIB found that the group with liberal blood transfusion had a higher mortality and rebleeding (13). Jairath *et al.* in a multicenter feasibility (TRIGGER) trial found that restrictive strategy of blood transfusion in patients with UGIB can be used in many centers with the same result as in a single center study (14). The UK guidelines (15) and Baveno VI (16) consensus also recommend that RBC transfusion be done in a restrictive fashion in UGIB, although individual patient factors like cardiovascular disorder, age, hemodynamics and ongoing exsanguination bleeding should be kept in mind (17) when a liberal strategy must be used.

But adherence to these existing guidelines is poor, as has been shown in a recent nationwide study in the UK by Desborough *et al.* (18). In this study, the threshold of Hb% for blood transfusion was >8 g/dL in 26% of the patients, who received transfusion for UGIB due to cirrhosis. This could be due to the fact that cirrhotic patients with bleeding present to the emergency medical care team who trigger massive transfusion protocol and are seen later by the specialists. The same may be true with the case published in the iMDT corner of *AME Medical Journal* (2). The liver study group in the UK has issued a decompensated care bundle with a checklist which may improve the acute care of liver patients including the blood transfusion strategies (19). This may be helpful in the emergency setting in the first 24 hours when a specialist gastroenterologist/hepatologist may not be available.

With the above evidence, it is time we stick to the recommended international guidelines in blood transfusion and follow a restrictive strategy of blood transfusion in cirrhotic patients with active UGIB. If necessary further trials may be conducted to guide further or affirm the same.

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