The effect of preoperative anemia on the odds of allogeneic blood transfusion (ABT) and patients outcomes in surgical patients with colorectal neoplasms: a single-center retrospective study

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**ABSTRACT**

**Backgrouds:**

Colorectal Neoplasms patients frequently have preoperative anemia, for whom allogeneic blood transfusion (ABT) was usually considered essential. While the optimal preoperative hemoglobin (Hb) value of transfusion is still being debated, this study aimed to determine the optimal Hb value on patient outcomes and transfusions.

**Methods:**

In this retrospective cohort study conducted in a tertiary hospital, Colorectal neoplasms patients with preoperative anemia undergoing surgery from JAN 1st 2015 to Dec 31st 2021 were included in xx Hospital. The primary outcomes were the association between Hb category and average length of stay (ALOS) and the odds of transfusion. The second outcomes was the risk factors of primary outcomes. Univariate and multivariate logistic regression analysis were applied to identify the association and risk factors.

**Results：**

A total of 14 352 inpatients were included, of whom 4 639 (32.32%) had preoperative anemia, with 3035 (21.15%) experiencing mild anemia, 1500 (10.45%) moderate anemia，and 104(0.72%) severe anemia. 1 418(9.88%) patients received ABT during the hospitalization, and 546(3.80%) patients received perioperative ABT. In the multivariate logistic regression analysis, a dose-response relationship was observed, compared with the no anemic group, in the patients with mild/moderate/severe anemia, the odds of transfusion during the hospitalization was higher, odds ratio [OR] respectively, 5.915, 95% confidence interval [CI]: 4.717-7.418, p<0.001; 104.777, 95% CI: 84.345-130.160, p<0.001; 13361.442, 95% CI: 816.004-218783.511, p<0.001 , and the odds of perioperative transfusion was higher, OR respectively, 4.332, 95% CI: 3.245-5.785, p<0.001; 27.492, 95% CI: 20.974-36.037, p<0.001; 20.912, 95% CI: 11.832-36.959, p<0.001), besides, the ALOS was longer, β respectively,0.619, 95% CI: 0.346-0.892, p<0.001; 1.188, 95% CI: 0.821-1.554, p<0.001; 1.395, 95% CI: 0.107-2.684, p=0.034.

**Conclusions:**

Anemia is a common phenomenon in colorectal neoplasms surgical patients and even mild anemia could be a deleterious predictor on the prognosis of colorectal neoplasms for subjects who had undergone surgery.

Keywords: anemia, colorectal cancer, surgery, hemoglobin, transfusion