Background and Aims This study aimed to compare the effectiveness and safety of different blood management strategies in patients undergoing total knee arthroplasty (TKA). The study compared the use of prophylactic allogeneic blood transfusion, autologous transfusion, and intra-articular tranexamic acid administration with a control group that did not receive any prophylactic intervention.

Methods This retrospective cohort study enrolled 711 patients who underwent unilateral total knee arthroplasty and were divided into four groups: the allogeneic transfusion group (group AT), the autologous transfusion group (group AL), the tranexamic acid group (group TA), and the control group (group C). The primary outcome measured was the rate of postoperative allogeneic blood transfusions. Secondary outcomes included postoperative hemoglobin and hematocrit levels, postoperative bleeding amount, and the incidence of hypotension.

Results The groups AT and AL did not exhibit a significant reduction in postoperative allogeneic blood transfusion rates compared to group C (28/108, p=0.21 and 37/159, p=0.78, respectively). However, group TA demonstrated a significantly lower rate of postoperative allogeneic blood transfusions compared to group C (22/125 vs 3/125; P = 0.0001). The postoperative hemoglobin and hematocrit levels were statistically lower in group TA than in group C, but the levels in groups AT and AL did not differ significantly from those of group C.

Conclusions Our study indicates that intraoperative prophylactic transfusion did not result in a reduction in the postoperative transfusion rate when compared to the control group in patients undergoing total knee arthroplasty. However, the group receiving tranexamic acid showed lower transfusion rates and higher levels of hemoglobin and hematocrit.

IRB approval