Enhanced Recovery after Surgery (ERAS) clinical pathway for pancreatic surgical patients decreases unnecessary blood product administration

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INTRODUCTION

The consequences of excessive intraoperative volume administration for pancreatic surgery can lead to a variety of complications including iatrogenic dilutional anemia and unnecessary blood transfusion. Perioperative blood transfusion for pancreatic surgical patients has been associated with cancer recurrence and decreased survival (1). Retrospective chart review of pancreatic surgical patients at our institution showed that 27% (16/59) patients received a blood transfusion intraoperatively in the setting of excessive fluid administration. We introduced a goal directed fluid therapy (GDFT) algorithm and transfusion guidelines as part of an ERAS clinical pathway to help improve intraoperative fluid management and decrease potentially avoidable blood product administration.

MATERIALS AND METHODS

All patients having major laparoscopic or open pancreatic surgery were included in the ERAS clinical pathway. Patients who had major pancreatic surgery from the past year were used as historical controls. ERAS patients were managed intraoperatively using a GDFT algorithm and transfusion guidelines were provided. Preoperative and postoperative hemoglobin and hematocrit, intraoperative fluid administration, and surgical blood loss were recorded.

RESULTS

PRBC ADMINISTERED TO WHIPPLES	CONTROLS	ERAS	DIFFERENCE
Total number of patients	42	23	
Number of patients transfused	14	4	
Percent of patients transfused	33.3%	17.4%	-15.9
Average number of units transfused	2.2	2.0	-0.2
p-value	0.248		

PRBC ADMINISTERED TO DISTALS	CONTROLS	ERAS	DIFFERENCE
Total number of patients	17	19	
Number of patients transfused	2	2	
Percent of patients transfused	11.8%	10.5%	-1.2
Average number of units transfused	2.0	1.5	-0.5
p-value	1.0		

Patient Demographics, Anthropometrics, and Clinical Characteristics (Whipples)	Traditional (N=42)	ERAS (N=23)
Age on DOS (y)	61.9 ±13.2	67.0 +/- 10.87
Male/female	21/21	14 / 9
Weight (kg)	75.4 ± 18.9	75.5 +/- 18.91
Body Mass Index	27.1 ± 6.9	25.8 +/- 5.29
Estimated Blood Loss	691 ± 387	559 +/- 309.6
Crystalloids	4423 ± 1511.8	4348 +/- 1238.9
Colloids	750 ± 579.1	1098 +/- 587.5

Patient Demographics, Anthropometrics, and Clinical Characteristics (Distals)	Traditional (N=17)	ERAS (N=19)
Age on DOS (y)	54.4 ± 8.6	58.2 +/- 12.32
Male/female	6/11	11 / 8
Weight (kg)	84.0 ± 19.6	86.5 +/- 18.42
Body Mass Index	29.4 ± 6.9	29.3 +/- 4.17
Estimated Blood Loss	500 ± 478	438.2 +/- 470.4
Crystalloids	2988 ± 1292.1	2691 +/- 897.1
Colloids	368 ± 606.7	645 +/- 488.2

DISCUSSION

Beyond the risks of allogeneic exposure, blood transfusion for surgical cancer patients has been associated with decreased survival and tumor recurrence. It is thought that blood transfusion has both an immunosuppressive and tumor-promoting effect (2). An ERAS clinical pathway for pancreatic surgery that includes GDFT and transfusion guidelines helps avoid excess volume administration and unnecessary blood product administration, which are critical goals for this patient population.

While the difference in transfusion rates in the Whipple group was not statistically significant, there was a trend toward decreased transfusion. The amount of volume administered to both groups was similar. The effect of decreased transfusion rates for Whipple patients is most likely due to proper application of transfusion gudielines. A larger sample size is needed to observe clinical significance.

REFERENCES

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