JMSCR Vol||05||Issue||10||Page 29130-29133||October 2017

www.jmscr.igmpublication.org
Impact Factor 5.84
Index Copernicus Value: 71.58
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v5i10.113

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Perioperative Blood Transfusion in Patients Undergoing Cancer Surgery- A Clinical Study

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Abstract
Background: *Allogenic blood transfusion is associated with several potential complications, especially in patients with cancer. The hazards of allogenic blood transfusion include transmission of infection and immunological reactions. The aim of the study was to identify the rates of perioperative blood transfusion and over transfusion in patients undergoing cancer surgery.*
Materials & Methods: *This study was conducted in the department of Anesthesiology in year 2015. It included 1236 patients of both genders. Information such as intra-operative blood loss and fluid therapy, blood and blood products transfused (if any) and any intraoperative investigations were recorded.*
Results: *Out of 1236 patients, males were 616 and females were 620. The difference was non- significant (P-1). Mean age of males were 62.2 years and females 58.7 years. Mean weight was 68.6 kg and 66.4 kg respectively. ASA status was I (males- 32%, females- 30%), II (males-18%, females- 16%), III (males- 2%, females- 2%). Hemoglobin Hb was <8 (males- 2.5%, females- 1.5%), 8-10 (males- 6%, females- 4%), >10 (males- 42%, females- 44%). Need of blood transfusion was divided into low (males- 30%, females- 34%), moderate (males- 14%, females- 16%) and high (males- 4%, females- 2%). The difference was non-significant (P> 0.05).*
1 unit blood was used in 680 patients, with 65% appropriate rate and 35% over transfusion. 2 units blood was used in 412 patients, with 52% appropriate rate and 48% over transfusion. >2 units blood was used in 144 patients, with 44% appropriate rate and 56% over transfusion.
Conclusion: *Blood transfusion is required in most of cancer patient surgeries. There is requirement of strict watch on amount of blood to be transfused and over transfusion.*
Keywords: *Blood transfusion, Infection, Immunological reactions.*

Introduction

Allogenic blood transfusion is associated with several potential complications, especially in patients with cancer. The hazards of allogenic blood transfusion include transmission of infection and immunological reactions. Blood

transfusions represent the top five most frequently overused therapeutic procedures. Unfortunately, a clinically significant number of patients (30–75%) with BC receive blood products during and after RC. Although BTs can be life-saving in some clinical perioperative circumstances, there are adverse events associated with their administration including transfusion-related immune suppression (TRIM).[1]

In cancer patients, there is additional concern about the effects of transfusion-related immunomodulation on tumor recurrence and survival. A recent meta-analysis suggests an association between perioperative transfusion and colorectal cancer recurrence. Studies have looked at perioperative blood transfusion practice and have identified inappropriate transfusion rates between 19 and 53%.[2] It has been speculated that the infusion of growth factors (vascular endothelial growth factor and transforming growth factor-b) and an enhanced inflammatory response as a result of the exposure of the recipient immune system to donor microparticles could also stimulate spread and proliferation of cancer cells.[3]

The aim of the study was to identify the rates of perioperative blood transfusion and over transfusion in patients undergoing cancer surgery.

Materials & Methods

This study was conducted in the department of Anesthesiology in year 2015. It included 1236 patients of both genders. All patients were informed regarding the study and written consent was obtained. Information such as intra-operative blood loss and fluid therapy, blood and blood products transfused (if any) and any intraoperative investigations were recorded.

The existing practice at the time of the study was to transfuse patients whose blood loss exceeded the maximum allowable blood loss (MABL) {[MABL = (pre-operative Hb – target Hb)/ average Hb] * blood volume}. All patients were followed up for 24 h after surgery to identify transfusions in the post-operative period.

A patient was considered to be over transfused if the post transfusion Hb was more than 10 g/dL.

Two senior anaesthesiologists classified surgeries into three categories based on their likelihood of needing transfusion – low (e.g., breast, modified radical neck dissection), moderate (e.g., colectomy, pancreatectomy) and high (e.g., major pelvic bone resections, liver resections, open prostatectomy). Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I shows that out of 1236 patients, males were 616 and females were 620. The difference was non- significant (P-1). Table II shows demographic data of patients. Mean age of males were 62.2 years and females 58.7 years. Mean weight was 68.6 kg and 66.4 kg respectively. ASA status was I (males- 32%, females- 30%), II (males-18%, females- 16%), III (males- 2%, females- 2%). Hemoglobin Hb was <8 (males- 2.5%, females- 1.5%), 8-10 (males- 6%, females- 4%), >10 (males- 42%, females- 44%). Need of blood transfusion was divided into low (males- 30%, females- 34%), moderate (males- 14%, females- 16%) and high (males- 4%, females- 2%). The difference was non- significant (P> 0.05).

Table III shows that I unit blood was used in 680 patients, with 65% appropriate rate and 35% over transfusion. 2 units blood was used in 412 patients, with 52% appropriate rate and 48% overtransfusion. >2 units blood was used in 144 patients, with 44% appropriate rate and 56% over transfusion.

Table I Distribution of patients

Total- 1236		
Male	Female	P value
616	620	1

Table II Demographic data of patients

	Males	Females	P value
Age (Mean)	62.2 years	58.7 years	0.1
Weight (Mean)	68.6 kg	66.4 kg	1
ASA status			
I	32%	30%	1
II	18%	16%	1
III	2%	2%	1
Hb (gm%)			
<8	2.5%	1.5%	0.2
8-10	6%	4%	0.31
>10	42%	44%	0.4
Need transfusion			
Low	30%	34%	0.1
Moderate	14%	16%	0.2
High	4%	2%	0.5

Table III Number of units of blood transfusion

Units	Total number	Appropriate	Over transfusion
1	680	65%	35%
2	412	52%	48%
>2	144	44%	56%

Discussion

The effect of allogenic blood transfusion on long term outcomes in patients undergoing cancer surgery is not well understood. Studies have shown "moderate association" between allogenic blood transfusion and early recurrence in patients with colorectal cancer, a causal relationship has not been established.[4] The aim of the study was to identify the rates of perioperative blood transfusion and over transfusion in patients undergoing cancer surgery.

In this study, out of 1236 patients, males were 616 and females were 620. We found that mean age of males were 62.2 years and females 58.7 years, mean weight was 68.6 kg and 66.4 kg in males and females, respectively. This is in accordance to Spenser J et al.[5]

32% males and 30% females showed ASA status I, II (males-18%, females- 16%), 2% males and 2% females- 2% showed ASA status III. This is in agreement to Niraj G et al.[6] Hemoglobin Hb was <8 (males- 2.5%, females- 1.5%), 8-10 (males- 6%, females- 4%), >10 (males- 42%, females- 44%). This is in accordance to Mallet et al.[7]

30% males and 34% females showed low need of blood transfusion, moderate (males-14%, females- 16%) and high (males- 4%, females- 2%). This is in agreement with Sudhindran et al.[8]

We found that I unit blood was used in 680 patients, with 65% appropriate rate and 35% over transfusion. 2 units blood was used in 412 patients, with 52% appropriate rate and 48% over transfusion. >2 units blood was used in 144 patients, with 44% appropriate rate and 56% over transfusion. This is in agreement with Hallisey et al.

Conclusion

Blood transfusion is required in most of cancer patient surgeries. There is requirement of strict watch on amount of blood to be transfused and over transfusion.

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