The Correlational Study of Percentage of Heamoglobin in Patients who are Undergoing Split Skin Graft Procedure

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Abstract: The study evaluates the impact of anemia on wound healing and skin graft uptake in patients undergoing split skin grafting. Conducted in a tertiary care setting, the research involved 50 patients, divided based on hemoglobin (Hb) levels—Group A with Hb < 10 g/dL and Group B with Hb \geq 10 g/dL. After surgical intervention and routine wound care, the skin graft take was assessed on the 10th postoperative day, revealing no significant difference in graft acceptance between the groups. The findings suggest that maintaining Hb levels at or above 10 g/dL may not be essential for successful wound healing in mild to moderate anemia cases, where adequate circulatory volume compensates for oxygen demand. Thus, prophylactic transfusion may be unnecessary for such patients, emphasizing a need to re - evaluate transfusion practices in surgical care.

Keywords: anemia, wound healing, skin graft, hemoglobin, blood transfusion

1. Introduction

- The sufficient oxygen supply and avoidance of wound infection is critical to the healing process as ischemic tissues heal poorly and get easily infected.
- The hemoglobin level should be maintained above 10g/dL to promote wound healing.
- A strategy commonly employed by surgeons is to request more units of blood than they anticipate transfusing intraoperatively to provide a margin of safety in the event of unexpected hemorrhage. The ready availability of one or two cross - matched units of blood in the operating room
- It is important to re evaluate the blood transfusion policy because of an inherent risk of transfusion reaction, transmission of many viral, bacterial and parasitic diseases, increased workload over blood banks and increased cost of patient care.
- The blood transfusions have non specific immuno suppressive properties that render recipients susceptible to infectious complications and retard wound healing.
- The present study was conducted to evaluate the state of wound healing in relation to split skin graft take in anaemic patients.

2. Material and Methods

Inclusion Criteria:

- Age group 18 to 65 years.
- The patients with raw healing area.

Exclusion Criteria:

- Patients with known history of diabetes mellitus
- Patients with known history of Hypertension.

- Bronchial asthma, tuberculosis.
- Patients with known history of of steroid administration.

Methodology

- This was a correlational study conducted in tertiary care centre.
- Demographic data in terms of age, occupation, duration was documented.
- The patients who are undergoing split skin grafting [patients with Hb < 10 % (group A) and patients with Hb > 10 % (group B)]. Were included for this study. Routine blood investigation done.
- On admission, all the patients with healing raw surface area were treated with antibiotics, wound management and care of nutrition till their wound either healed or granulated.
- Patients were divided into study groups (n = 22) with haemoglobin < 10 g/ dL, haematocrit < 6 gm% [group A] and control group (n = 22) with haemoglobin level = or > 10 g/dL and haematocrit = or > 30% [Group B].
- After debridement of recipient site, split thickness skin graft was harvested from thigh and applied on the raw area.
- The average raw area covered with skin graft in study group was 5 *6 cm and in control group was 7*6 cm. Assessment of skin graft take was done on 10th postoperative day.
- Haemoglobin and haematocrit were again measured on 1st and on 10th postoperative day.
- Results were assessed in terms of haemoglobin and haematocrit levels of the patients.

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Split skin graft uptake in patients with Hb <10%



3. Results

Descriptive Statistics							
	Ν	Minimum	Maximum	Mean	Std. Deviation		
Age	50	19	70	38.06	14.507		
Hb% Preop	50	7.8000	13.5000	10.264000	1.6617866		
Hb% on POD 10	50	7.9000	13.0000	10.108000	1.528831		
Valid N (Likewise)	50						

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			Group * Graft Stastus Crosstabulation						
			Not Done	Rejected	Taken				
hb <10gm	<10 am	Count	3	0	22				
	<10gm	% within Group	12.0%	0.0%	88.0%				
	> 10.1am	Count	2	1	22				
>10.1gm		% within Group	8.0%	4.0%	88.0%				
Total		Count	5	1	43				
	Total	% within Group	10.0%	2.0%	86.0%				

	Group * C/S Crosstabulation													
				C/S										
			acinetobacter	acinetobacter Bacteroids E.Coli Enterbacter enterococcus Kiebsiella MDR MRSA Proteus Stap.aureus Strap.betahe						Total				
Hb	<10 gm	Count	3	1	2	1	2	4	0	3	4	2	3	25
	<10gm	% within Group	12.0%	4.0%	8.0%	4.0%	8.0%	16.0%	0.0%	12.0%	16.0%	8.0%	12.0%	100.0%
	>10.1cm	Count	3	0	1	1	1	4	1	3	6	3	2	25
	>10.1gm	% within Group	12.0%	0.0%	4.0%	4.0%	4.0%	16.0%	4.0%	12.0%	24.0%	12.0%	8.0%	100.0%
Total Count		6	1	3	1	3	8	1	6	10	5	5	50	
		% within Group	12.0%	2.0%	6.0%	2.0%	6.0%	16.0%	2.0%	12.0%	20.0%	10.0%	10.0%	100.0%

				Sex						
			Female	Female	FM	Male	Total			
	<-20	Count	0	0	0	4	4			
	<=20	% within Age (Binned)	0.0%	0.0%	0.0%	100.0%	100.0%			
	21 40	Count	7	0	1	19	27			
Age	21-40	% within Age (Binned)	25.9%	0.0%	3.7%	70.4%	100.0%			
(Binned)	41 60	Count	6	1	0	8	15			
	41- 00	% within Age (Binned)	40.0%	6.7%	0.0%	53.3%	100.0%			
	61	Count	0	0	0	4	4			
	01+	% within Age (Binned)	0.0%	0.0%	0.0%	100.0%	100.0%			
61+	Count	13	1	1	35	50				
100	ai	% within Age (Binned)	26.0%	2.0%	2.0%	70.0%	100.0%			

Age (Binned)* sex	Crosstabu	lation
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Age (Binned)* * Graft Stastus Crosstabulation									
			Graft Stastus						
			Taken	Not Done	Rejected	Taken			
	<20	Count	0	1	1	2			
	<=20	% within Age (Binned)	0.0%	25.0%	25.0%	50.0%			
	21-40	Count	1	1	0	25			
Age		% within Age (Binned)	3.7%	3.7%	0.0%	92.6%			
(Binned)	41- 60	Count	0	1	0	14			
		% within Age (Binned)	0.0%	6.7%	0.0%	93.3%			
	61	Count	0	0	0	2			
	01+	% within Age (Binned)	0.0%	50.0%	0.0%	50.0%			
T-4-1		Count	1	5	1	43			
100	ai	% within Age (Binned)	2.0%	10.0%	2.0%	86.0%			

(**D** · 1.

4. Discussion

This study involves 50 patients among that 25 patients were having Hb <10 gm% and 25 patients were having Hb > 10 gm%.

4 patients with Hb <10 gm% had streptococcus beta hemolyaticus growth and 3 patients with Hb > 10 gm %.

Anaemia is frequently blamed because the haemoglobin is considered essential to maintain proper oxygenation.

The effect of anaemia on wound healing remains uncertain and the decision to transfuse blood is influenced by the 10/30 empirical dictum that a patient with haemoglobin level < 10 gm% and haematocrit level < 30% requires blood transfusion.

Elective surgery is usually delayed to combat this deficiency, either by preoperative haematinics or by blood transfusions.

Despite various human studies, no clinical consensus has been achieved on the absolute threshold for prophylactic transfusion in anaemic patients.

Furthermore, in anaemia there is increased cardiac output, decreased blood viscosity and decreased peripheral resistance; all of which lead to increased perfusion thereby

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mitigating the ill effects of anaemia.

As wounds consume less O2 in comparison to normal tissues, P02 in wounded tissue can be maintained by increased perfusion with anaemic arterial blood despite its low oxygen content

It is possible for a haemoglobin concentration of 6.5 g/dL to deliver the required 260 ml of oxygen/ minute. Further, there is increase in concentration of 2, 3 diphosphoglycerate (2, 3 DPG) in red blood cells which favours the unloading of oxygen from haemoglobin to erythrocytes.

This critical point is defined by various investigators in the range of haemoglobin 6 g/dL and PCV 18% and this point is considered as the transfusion trigger.

The equal acceptance of graft in study and control group implies that anaemia do not necessarily retard wound healing.

None of the patients required blood transfusion during surgery or postoperative period. All the patients in the study group tolerated anaesthesia well and remained stable throughout the procedure.

This shows that perioperative blood transfusion can be avoided in the surgical care of most patients who have normovolaemic anaemia without mortality and without significant morbidity.

5. Conclusion

It is not mandatory to keep haemoglobin level at or >10 g/dL or PCV value at or >30% for skin graft take, as mild to moderate anaemia per se does not cause any deleterious effect on wound healing; provided perfusion is maintained by adequate circulatory volume.

Prophylactic transfusion to increase the oxygen carrying capacity of the blood for the purpose of wound healing is not indicated in asymptomatic anaemic patients (with haemoglobin levels greater than 6g/dL) without significant cardiovascular or pulmonary disease.

However, severe anaemia (haemoglobin 6g/dL) needs to be corrected before surgery.

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