



THE CORRELATIONAL STUDY OF HAEMOGLOBIN PERCENTAGE IN PATIENTS WHO ARE UNDERGOING SPLIT SKIN GRAFT PROCEDURE

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ABSTRACT:

Aims and Objectives: To assess the split skin graft uptake in patients with mild to moderate anaemia.

Background: Traditional wisdom is that wound healing is directly related to haemoglobin in the blood, therefore blood transfusion is given in anaemic patients to raise the haemoglobin level for better wound healing.

Methods: This study is conducted in tertiary health care centre in North Karnataka, evaluation of wound healing in the form of split thickness skin graft take was done in 20 anaemic patients (haemoglobin level of < 10gm/dl) and compared with control group (patients with a haemoglobin level of 10 or > 10gm/dl).

Results: There was no statistically significant difference in mean graft take between the two groups.

Conclusion: It is not mandatory to keep haemoglobin level at or >10g/dl for skin graft take, as mild to moderate anaemia per se does not cause any deleterious effects 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.

Limitations: Further studies with a larger population are required.

INTRODUCTION:

- The success of skin grafting, or take depends on
- 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 haemoglobin level should be maintained above 10g/dL to promote wound healing.
- The empirical, dogmatic approach to blood transfusion
- Today, this principle no longer appears valid
- 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 haemorrhage.

- 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.

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 steroid administration.
 - 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 < 30% [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.
- Split skin graft uptake in patients with Hb > 10 %



Split skin graft uptake in patients with Hb < 10 %



RESULTS:

Descriptive Statistics					
	N	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	1.5328831
Valid N (listwise)	50				

GROUP * graft status Crosstabulation						
			graft status			
				NOT DONE	REJECTED	taken
hb	<10gm	Count		3	0	22
		% within GROUP		12.0%	0.0%	88.0%
	>10.1gm	Count		2	1	22
		% within GROUP		8.0%	4.0%	88.0%
Total		Count		5	1	43
		% within GROUP		10.0%	2.0%	86.0%

GROUP * C/S Crosstabulation															
			C/S												Total
			acinetobacte	bacteroids	E.coli	enterbacter		enterococcus	klebsiella	MDR	MRSA	proteus	stap.aureus	strap.betaha	
Hb	<10gm	Count	3	1	2	1		2	4	0	3	4	2	3	2
		% 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%
	>10.1gm	Count	3	0	1	1		1	4	1	3	6	3	2	2
		% 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	5
		% 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%

age (Binned) * sex Crosstabulation							
			sex				Total
			female	female	FM	male	
age (Binned)	<= 20	Count	0	0	0	4	4
		% within age (Binned)	0.0%	0.0%	0.0%	100.0%	100.0%
	21 - 40	Count	7	0	1	19	27
		% within age (Binned)	25.9%	0.0%	3.7%	70.4%	100.0%
	41 - 60	Count	6	1	0	8	15
		% within age (Binned)	40.0%	6.7%	0.0%	53.3%	100.0%
	61+	Count	0	0	0	4	4
		% within age (Binned)	0.0%	0.0%	0.0%	100.0%	100.0%
Total		Count	13	1	1	35	50
		% within age (Binned)	26.0%	2.0%	2.0%	70.0%	100.0%

age (Binned) * sex Crosstabulation						
			sex			
			female	female	FM	male
age (Binned)	<= 20	Count	0	0	0	4
		% within age (Binned)	0.0%	0.0%	0.0%	100.0%
	21 - 40	Count	7	0	1	19
		% within age (Binned)	25.9%	0.0%	3.7%	70.4%
	41 - 60	Count	6	1	0	8
		% within age (Binned)	40.0%	6.7%	0.0%	53.3%
	61+	Count	0	0	0	4
		% within age (Binned)	0.0%	0.0%	0.0%	100.0%
	Total	Count	13	1	1	35
		% within age (Binned)	26.0%	2.0%	2.0%	70.0%

age (Binned) * graft status Crosstabulation						
			graft status			
			taken	NOT DONE	REJECTED	taken
age (Binned)	<= 20	Count	0	1	1	2
		% within age (Binned)	0.0%	25.0%	25.0%	50.0%
	21 - 40	Count	1	1	0	2
		% within age (Binned)	3.7%	3.7%	0.0%	92.6%
	41 - 60	Count	0	1	0	1
		% within age (Binned)	0.0%	6.7%	0.0%	93.3%
	61+	Count	0	2	0	2
		% within age (Binned)	0.0%	50.0%	0.0%	50.0%
	Total	Count	1	5	1	7
		% within age (Binned)	2.0%	10.0%	2.0%	86.0%

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 hemolyticus 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 mitigating the ill effects of anaemia.
- As wounds consume less O₂ in comparison to normal tissues, P_{O2} 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.

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.

References:

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