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Research Article

Anaemia in surgical patients and its effect on recovery of patients

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ABSTRACT

Background: People who are anemic develop symptoms caused by the inadequate delivery of oxygen to their body tissues. This can vary from simple fatigue to death according to the nature and severity of the anaemia. In presence of anaemia, there are increased chances of morbidity and mortality resulting to a loss of the individual is particulars and nation at large. Anaemia in one, such, which the surgeons have had to deal with in promoting convalescence and healing in every day, practice. Prior knowledge of wound healing capacity in-patients with various surgical diseases is of great importance in the selection of appropriate treatment and for the prognosis of the patients.
Methods: The present study was carried out in the Department of Surgery, S.S. Medical College and associated Gandhi Memorial Hospital, Rewa (M.P.) the material for the study comprised of randomly selected 200 anemic patients, during the period from 1st September 2000 to 31st June 2001. Patients admitted in routine or emergency time thoroughly interrogated for personal information. A thorough clinical examination was done to assess general condition of patients and systemic disorder. In case of surgical emergency arrival of the patient clinical examination was immediately started and history asked during the resuscitation of the patient. Patients were investigated either previously or after admission with special reference to haemoglobin, blood group and relevant investigations according to clinical diagnosis like x-ray, Ultrasonography, biopsy and prepared for surgical intervention as required. The line of treatment whether conservative or operative was also recorded in detail dates wise. All details of blood transfusion to the patient, pre-operative or post-operative were recorded date wise.
Results: Majority of anemic patient were of malignancy (41%). Next common group of hemorrhoid (21.5%), minimum cases were for infected wound (7.5%).The incidence of malignancy and severity of anaemia both were more in female as compared to male. Study subjects were distributed nearly equal numbers between age 31 to above 60 yr. It was observed that severity of anaemia increased with the percentage of burn. Impairment of wound healing was noted in moderate degree of anaemia (6-10.9%), superficial gapping 40% incomplete dehiscence 8% was noted and severe anaemia (below 6 gm % Hb) all the cases noted complete dehiscence. Majority of the cases 67-87% were infective groups belongs to moderate and severe degree of anaemia.
Conclusions: Anaemia in surgical patients can be prevented by early diagnosis and treatment of lesion where bleeding is present.

Keywords: Anaemia, Hemoglobin, Burn, Blood transfusion

INTRODUCTION

The term anaemia is derived from Ancient Greek for "bloodlessness''. It is a condition involving an abnormal reduction of haemoglobin content. Red blood cells (containing haemoglobin) are the means y which oxygen is carried to the various part of the body.

People who are anemic develop symptoms caused by the inadequate delivery of oxygen to their body tissues. This can vary from simple fatigue to death according to the nature and severity of the anaemia. The condition is far more common in women than in man.

The most common type of anaemia is iron deficiency anaemia, which occurs when the body's need for iron increases, as during childhood and in pregnancy or when there is insufficient iron in the diet or there is chronic loss of blood.

Transfusions are still used in case of acute blood loss, iron supplement for iron deficiency anaemia and injection of vitamin B12 for pernicious anaemia are often effective. Synthetically manufactured erythropoietin (normally produced by the human kidney) is now used to stimulate the production and growth of red blood cells. Other therapy focuses on curing the underlying cases of anaemia the nutritional or chronic of blood.[1-3]

Blood transfusions and loss of blood recently bone marrow transplants, are necessary forms of treatment for aplastic anaemia.

The blood is the most precious fluid in the body, a fact expressed in such common term as "The life blood". It is not surprising therefore, that from very early times we find reference to the value of blood. It is interesting to note that many of the diseases reflect is 'Anaemia' a pathological state which results from the quantitative mobility of the organ to transport oxygen to tissue that is to say lack of oxygen carrying capacity of various diseases amongst these most notable are malignancies, burn and other condition of blood loss. In our hospital surgical patients are often anemic. They do not attend hospital primarily for anaemia, but they come for some other surgical conditions. Anaemia is not only believed to causes delayed wound healing, but also makes the patients stay in the hospital critical and prolonged .Their stay is usually never uneventful, thus affecting the convalescence of the patients and their return to work.

In presence of anaemia, there are increased chances of morbidity and mortality resulting to a loss of the individual is particulars and nation at large.

Man can not initiate or directly promote the healing process. He can help in accelerating the process by doing away with the decelerating factors. For a quick return to work specially in industrial era, the scientists have pondered on such measures to counteract causes. Anaemia in one, such, which the surgeons have had to deal with in promoting convalescence and healing in every day, practice. Prior knowledge of wound healing capacity in-patients with various surgical diseases is of great importance in the selection of appropriate treatment and for the prognosis of the patients.[4-11] With this background, the present study has been carried out to evaluate various aspect related to anaemia in surgical patient and its effect on recovery of patient.

METHODS

The present study was carried out in the Department of Surgery, S.S. Medical College and associated Gandhi Memorial Hospital, Rewa (M.P.) the material for the study comprised of randomly selected 200 anemic patients, during the period from 1st September 2000 to 31st June 2001. Ethical considerations were met through intuitional ethical committee. Each patient was informed and consent was taken.

Record of history and clinical examination

Patients admitted in routine or emergency time thoroughly interrogated for personal bio-data, age, sex, occupation, presenting complains, detailed presents history, past illness, family history, associated systemic disorder and previous treatment received by them.

A through clinical examination was done to assess general condition of patients and systemic disorder. Local examination was done to make a surgical diagnosis and associated problem. In case of surgical emergency arrival of the patient clinical examination was immediately started and history asked during the resuscitation of the patient.

Principles of emergency management were followed rigidly keeping in view patency of airway, breathing and circulation of patient. Priorities were fixed and intravenous route established immediately preceded by collection of blood sample and starting the required fluids and antibiotics as indicated by surgical problem.

Patients were investigated either previously or after admission with special reference to haemoglobin, blood group and relevant investigations according to clinical diagnosis like x-ray , Ultrasonography, biopsy and prepared for surgical intervention as required.

Investigations done in each case were:

a. Haemoglobin estimation.
b. Total lymphocyte count.
c. Differential lymphocyte count.
d. Blood group

All details were recorded as mentioned in proforma (Appendices).

The line of treatment whether conservative or operative was also recorded in detail dates wise.

Haemoglobin estimation was done by Acid haematin method (Sahli's Haemoglobinometer) and according to haemoglobin patients were divided in mild, moderate and severe.

In the blood bank grouping and Rh typing was done by the group specific antisera. After getting report of blood group and hemoglobin of the patient, patient's attendant were told to arrange blood and form for blood donation was send to the blood bank with sample of blood collected from peripheral vein of the patient in sterile vial and search for blood donor was made. The blood transfusion was arranged by donor related to the patients, or by relative donor's exchange or by voluntary donation. If patients or his attendant fell to arrange the blood or denied, then haematinics were given.

All details of blood transfusion to the patient, pre-operative or post-operative were recorded date wise.

In malignancy patients, either operative or conservative given chemotherapy, evaluation of haemoglobin was done to see the effect of chemotherapy in anemic patient.

The plan of work carried includes,

i. Hematological investigation, especially Hb.
ii. Blood transfusion or Haematinics.
iii. Post-operative assessment of wound on 7th or 14th day.
iv. Haemoglobin estimation on 7th or 14th day of treatment either by conservative or operative method.

Data was compiled in MS-Excel and checked for its completeness and correctness. Then it was analyzed.

RESULTS

Majority of anemic patient were of malignancy (41%). Next common group of hemorrhoid (21.5%), minimum cases were for infected wound (7.5%) (Table 1).

Table 1: Distribution of study subjects.

Group wise distribution	No. cases	%
Malignancy	82	41
Hemorrhoid	43	21.5
Burn	30	15
Surgical Wound	30	15
Infected Wound	15	7.5
Total No.	200	100

Below table show that most of the cases in malignancy (79.21%) had heamoglobin in the range of 6 to 10.9 gm % (Table 2).

The incidence of malignancy and severity of anaemia both were more in female as compared to male (Table 3).

Study subjects were distributed nearly equal numbers between age 31 to above 60 yr (Table 4).

Table 2: Distribution of study subjects according to grade of anemia.

Anemia Grading	No. of cases	%
Below 6 gm %	7	8.5
6-8.9 gm %	31	37.8
9-10.9 gm%	34	41.4
11-13.5 gm %	10	12.3
Total No.	82	100.0

Table 3: Distribution of cases according to sex & severity of anaemia in malignancy.

Group	Male		Female	
	No.	%	No.	%
Blow 6 gm %	5	13.5	2	4.4
6-8.9 gm %	13	35.2	18	40
9-10.9 gm %	15	40.5	19	42
11—13.5 gm%	4	10.8	6	13
Total	37	100.0	45	100.0

Table 4: Distribution of cases according to age and severity of anaemia in malignancy.

Age Group In years	Concentration of Haemoglobin				Total	%
	Below 6 gm %	6-8.9 gm %	9-10.9 gm %	11-13.5 gm %		
21-30	-	2	4	1	7	8.54
31-40	-	6	9	3	18	21.95
41-50	1	10	8	2	21	25.6
51-60	5	4	7	1	17	20.73
>60	1	9	6	3	19	23.1
Total					82	100

It is evident that most of the cases (48.8%) had severe anaemia (below 6 gm %) belongs to second degree hemorrhoid (Table 5).

Table 5: Haemoglobin percentage in different degree of haemorrhoid.

Range of hemoglobin	No. of cases				Total
	1st Degree	2nd Degree	3rd Degree	4th Degree	
Below 6gm %	5	14	1	-	20
6-8.9 gm %	3	4	2	-	9
9-10.9 gm %	7	1	1	1	10
11-13.5 gm %	2	2	-	-	4
Total	17	21	4	1	43
%	39.5	48.8	9.3	2.32	100

Most of the cases of hemorrhoid (46.51%) had haemoglobin below 6 gm % (Table 6).

Below table shows that severity in anaemia in hemorrhoid maximum in 41-50 age groups (34.55%) (Table 7).

Table 6: Distribution of cases according to severity of anaemia in haemorrhoid.

Range of hemoglobin	No. of cases	Percentage
Below 6 gm%	20	46.51
6-8.9 gm%	9	20.93
9-10.9 gm %	10	23.25
11-13.5gm %	4	9.3
Total	43	100

Table 7: Distribution of cases according to age & severity of anaemia in haemorrhoid.

Age Group	Concentration of Haemoglobin				Total	%
	Below 6 gm %	6-8.9 gm %	9-10.9 gm %	11-13.5 gm %		
21-30	-	1	3	2	6	13.95
31-40	4	3	2	-	9	20.93
41-50	10	2	1	2	15	34.88
51-60	3	1	1	-	5	11.62
>60	3	2	3	-	8	18.6
Total	20	9	10	4	43	100

Majority of cases 51.16% of anaemia in hemorrhoid were duration of illness below 6 months followed by 6-12 months duration 16.2 (Table 8).

Table 8: Relationship of severity of anaemia to duration of haemorrhoid.

Duration Of Hemorrhoid	Severity of Anaemia				Total	%
	Below 6 gm %	6-8.9 gm %	9-10.9 gm %	11-13.5 gm %		
<6Months	16	5	1	-	22	51.16
6-12 months	2	3	2	-	7	16.2
1-3 years	1	1	2	1	5	11.6
3-5 years	1	-	3	1	5	11.6
5 years above	-	-	2	2	4	9.3
Total	20	9	10	4	43	100

It is evident that severity of anaemia increased with the percentage of burn (Table 9).

Below table shows that most of the cases 50% had haemoglobin at the range of 9-10.9 gm % (Table 10).

Table 9: Relationship, percentage of burn with severity of anaemia.

Percentage of Burn	Grade of Haemoglobin				Total	%
	Below 6 gm %	6-8.9 gm %	9-10.9 gm%	11-13.5 gm %		
11-20%		-	4	2	6	20
21-30%	-	-	5	1	6	20
31-40%	-	1	2	1	4	13.3
41-50%	-	4	2	-	6	20
51-60%	-	2	-	-	2	6.66
61-70%	-	1	1	-	2	6.66
71-80%	-	-	1	-	1	3.33
81-90%	-	2	-	-	2	6.66
91-100%	-	1	-	-	1	3.33
Total	-	11	15	4	30	100

Table 10: Distribution of cases according to severity of anaemia in burn.

Range of hemoglobin	No. of cases	Percentage
Below 6-8.9 gm%	11	36.66
9-10.9 gm %	15	50.0
11-13.5 gm %	4	13.33
Total	30	100

It is evident that surgery blood transfusion and iron combination therapy improve the anaemia (Table 11).

Table 11: Relationship of anaemia with type of treatment.

Types of Treatment	Rise in Hb%	Stationary Hb%	Fall Hb%	Total
Surgery	5	3	2	10
BT	5	-	-	5
Iron Therapy	10	7	4	21
Surgery+BT	4	-	3	7
Surgery+Blood+Iron	5	2	-	7
Total	29	12	9	50

It is evident that impairment of wound healing was noted in moderate degree of anaemia (6-10.9%), superficial gapping 40% incomplete dehiscence 8% was noted and severe anaemia (below 6 gm % Hb) all the cases noted complete dehiscence (Table 12).

It is evident that more the severity of anaemia more will be the duration of post-operative hospital stay (Table 13).

Majority of the cases 87-67% were infective groups belongs to moderate and severe degree of anaemia (Table 14).

Table 12: Response of haemoglobin to different types of therapy.

Pre-operative Hb%	Normal Healing		Superficial Gaping		Complete Dehiscence	
Below 6 gm %	-	-	-	-	2	4
6-8.9 gm %	5	10	12	24	3	6
9-10.9 gm %	7	14	8	16	1	2
11-13.5 gm %	8	16	4	8	-	-
Total	20	40	24	48	6	12

Table 13: Duration of post-operative hospital stay in different severity of anaemia.

Range of heamoglobin	No. of cases				Total
	Up to 10 day	11-20 days	21-30 day	>30 days	
Below 6gm %	-	-	2	2	4
6-8.9gm %	6	6	1	1	14
9-10.9gm %	11	9	2	1	23
11-13.5gm %	7	1	1	-	9
Total	24	16	6	4	50

Table 14: Severity of anaemia in infected wound.

Range of heamoglobin	No. of cases			
	Acute		Chronic	
	No.	%	No.	%
Below 6 gm%	2	13.33	-	-
6-8.9 gm%	6	40	2	13.33
9-10.9gm %	5	13.33	-	-
Total	13	86.67	2	13.33

It is evident that more the severity of anaemia more will be the total duration of hospital stay (Table 15).

Table 15: Relationship of total duration of hospital stay to the severity of anaemia.

Range of heamoglobin	Duration of Hospital stay			
	Up to 10 day	11-20 days	21-30 day	>30 days
Below 6gm %	-	-	-	2
6-8.9 gm%	-	8	6	5
9-10.9 gm %	3	7	9	3
11-13.5 gm %	4	2	1	-
Total	7	17	16	10

It is evident from the above table that in majority of cases in which blood transfusion was given, the pre-operative Hb estimation showed mild anaemia (10.3%). Moderate anaemia was present in 65% and severe anaemia 24.7% cases were recorded.

In case where blood transfusion was given in post-operative period and (16%) showed mild anaemia and 69% showed moderate anaemia (Table 16).

Table 16: Distribution of cases according of anaemia (Hb %) pre-operative/ post-operative.

Grade of Anaemia Hb gm %	Pre-operative		Post-operative	
	No.	%	No.	%
Below 6 gm %	19	24.7	10	12
6-8.9 gm %	22	28.6	25	32
9-10.9 gm %	28	36.4	29	37
11-13.5 gm %	8	10.3	13	16
Total	77	100	77	100

DISCUSSION

The term anaemia is derived from Ancient Greek for "bloodlessness". It is a condition involving an abnormal reduction of haemoglobin content. Among the different etiological type of anemia, iron deficiency anaemia is the most common. It has been the usual trend to describe the anaemia as primary or secondary. The anaemia of secondary variety is secondary to some other important pathology. Anaemia of different surgical condition belongs to this group. Factors of diverse origin are responsible for producing the anaemia in different surgical problems. These include blood loss, ineffective erythropoesis and haemolysis. Though the diagnosis of anaemia is easier, it is usually difficult to find out the etiological factors causing these anemia's. Under the condition low socio-economic status of the patients with poor nutrition, anaemia is a frequent accompaniment of various surgical conditions. But it is difficult to predict whether anaemia is due to nutritional deficiency or due to the effect of primary surgical condition.[1,2,8,10]

Untreated preoperative anemia and acute perioperative blood loss may add to surgical risk. Few studies were found that evaluated the impact of anemia on other outcomes, such as functional status and costs and resource utilization, to draw reliable conclusions. Several other factors also limited the interpretation of the data, including the lack of a uniform definition for anemia and a dearth of studies expressly designed to quantify the prevalence and impact of anemia. Establishing a uniform definition and specifically evaluating the effect of anemia on outcomes are important considerations for future study.[12]

Anemia is common in patients with cancer. A systematic literature review had identified the prevalence of anemia in specific cancers and assessed the impact of anemia on survival and quality of life (QOL). Anemia prevalence varied widely; most studies found that between 30% and 90% of patients with cancer had anemia. Prevalence was affected strongly by the definition of anemia: 7% of patients with Hodgkin disease had anemia when the condition was defined as a hemoglobin level <90.0 g/L; as many as 86% of patients had anemia when it was defined as a hemoglobin value <110.0 g/L. Prevalence varied by cancer type and disease stage: 40% of patients with early-stage colon tumors and nearly 80% of patients

with advanced disease had anemia. Patients with anemia had poorer survival and local tumor control than did their nonanemic counterparts in 15 of 18 studies under this systematic literature review. In 8 of 12 studies, patients without anemia (most treated with epoetin) needed fewer transfusions. Quality of Life (QOL) was positively correlated with hemoglobin levels in 15 of 16 studies. Treatment of anemia may have a significant impact on patient survival and QOL as studied by Knight K, Wade S and Balducci L.[13]

Previously undiagnosed anaemia is common in surgical patients and is associated with increased likelihood of blood transfusion and increased perioperative morbidity and mortality. Anaemia should be viewed as a serious and treatable medical condition, rather than simply an abnormal laboratory value. Implementation of anaemia management in the surgery setting will improve patient outcomes.[14]

CONCLUSION

It was observed that anaemia in surgical patients is either due to acute loss of blood as seen in trauma and sudden and severe bleeding in hemorrhoids, malignancy, lesion of gut or breast or chronic loss of blood insensible loss of blood in 1st and 2nd degree hemorrhoids, malignancy, chronic infection and nutritional deficiency because of anorexia due to illness or under the influence of chemotherapy.

Anaemia in surgical patients can be prevented by early diagnosis and treatment of lesion where bleeding is presenting. Correction of anaemia should be done by all measures to enhance would healing.

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