

OCULAR MANIFESTATIONS IN PATIENTS WITH ANAEMIA

Pragati Garg¹, Astha Agrawal²

¹Professor and HOD, Department of Ophthalmology, Era's Lucknow Medical College and Hospital, Sarfarazganj, Lucknow.

²Junior Resident, Department of Ophthalmology, Era's Lucknow Medical College and Hospital, Sarfarazganj, Lucknow.

ABSTRACT

BACKGROUND

Anaemia is a commonest haematological disorder presenting with a variety of ocular manifestations. Their higher incidence is seen with the increase in severity.

The aim of the study is to determine distribution of various ocular manifestations in different types of anaemia and distribution of various fundus abnormalities in different grades of anaemia.

MATERIALS AND METHODS

The present study was conducted in 294 anaemic patients in Era's Lucknow Medical College irrespective of age and sex after the ethical clearance and due informed consent of the patients. The sociodemographic details of the patient were taken, type and severity of anaemia along with ocular manifestations with anaemia were recorded. Data was analysed by using Chi-square test and the 'p' value of less than 0.05 was taken as statistically significant.

RESULTS

Conjunctival pallor was the commonest ocular manifestation of anaemia seen in 100% cases. Retinal haemorrhage were the second commonest ocular manifestation observed in 35.71% cases. Diminution of vision was third commonest ocular manifestation seen in 28.91% cases. The results were highly significant whether it be the diminution of vision, lid oedema, subconjunctival haemorrhage, disc pallor, retinal haemorrhage or vascular changes and macular oedema ($p < 0.001$).

CONCLUSION

Each anaemic patient should be thoroughly evaluated for the ocular manifestations and every moderate to very severe anaemic patient should undergo mandatory fundus examination for identification of anaemic retinopathy.

KEYWORDS

Retinal Haemorrhage, Disc Pallor, Anaemia.

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BACKGROUND

Anaemia is a commonest haematological disorder presenting with variety of ocular manifestations.¹ It can affect every part of the eye and adnexa, but predominant features are conjunctival pallor and retinal haemorrhages.² Other retinal manifestation includes venous and arteriolar tortuosity, cotton wool spots, macular star and disc oedema. Their high incidence is correlated with severity of anaemia (substrate for retinal metabolism is reduced in anaemia and makes it prone for hypoxic damage because anaemia results in diminished capillary oxygenation, increased permeability and ultimately extravasation of blood and its products).

Eye being the direct window to observe the vascular changes in haematological disorders, fundus examination is done to diagnose as well as to observe the progression of a

systemic disorder.³ The high-risk group for anaemia are pregnant and lactating females and children and prevalence in this subgroup vary from 80 to 90% in the different parts of India,⁴ while the prevalence of anaemia in 16 to 70 years was 47.9%.⁵ The prevalence of anaemia was higher among females than males (50% vs. 44.3%) and much more in rural than urban areas.⁶

MATERIALS AND METHODS

An observational study was done on 294 anaemic patients irrespective of age and sex, after the ethical clearance and due informed consent of the patients.

All patients who gave history of any ocular surgery or trauma, ocular or systemic disorders, which could affect the fundus of the patient or eyes with ocular media haziness were excluded from the study.

All included patients were subjected to detailed ocular history and examination including visual acuity with and without pinhole by Snellen's chart, slit-lamp examination for anterior segment, fundus examination by direct and indirect ophthalmoscopy after full mydriasis. Fundus photography and FFA documentation was done with fundus camera. Complete haematological investigation was done. Severity of anaemia was graded according to haemoglobin levels with

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Corresponding Author:

Dr. Pragati Garg,

Professor and HOD, Department of Ophthalmology,

Era's Lucknow Medical College and Hospital,

Sarfarazganj, Lucknow.

E-mail: drpragati89@gmail.com

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10 mg% as mild, 6-10 mg% as moderate and less than 6 as severe. The details of the patient, type and severity of anaemia along with ocular manifestations with anaemia were recorded. Data was analysed by using Chi-square test and the 'p' value of less than 0.05 was taken as statistically significant.

RESULTS

Out of 294 patients of nutritional anaemia, iron deficiency was seen in 156 (53.06%) patients, megaloblastic anaemia was seen in 43 (14.62%) patients and dimorphic anaemia was seen in 95 (32.31%) patients.

In our study, we found that conjunctival pallor was the commonest ocular manifestation in anaemia and was present in all cases. Diminution of vision was noticed in 72% (n=31) of megaloblastic anaemia and 56% (n=54) patients of dimorphic anaemia. Patients with iron deficiency anaemia did not show visual impairment. Lid oedema was observed in 21.15% (n=33) patients with iron deficiency anaemia. It was not seen in patients with megaloblastic and dimorphic anaemia. Subconjunctival haemorrhage was seen in 13.95% (n=6) patients of megaloblastic anaemia and 12.63% (n=12) patients of dimorphic anaemia and was not seen in

patients with iron deficiency anaemia. Disc pallor was noted in the 9.61% (n=15) of iron deficiency anaemia, 41.86% (n=18) of megaloblastic and 21.05% (n=20) of dimorphic anaemia. Retinal haemorrhages were also seen all types of anaemia, the values were 10.89% (n=17) in iron deficiency anaemia, 53.48% (n=23) in megaloblastic and 68.4% (n=65) in dimorphic anaemia. The vascular changes were in the form of venous dilatation and tortuosity and were present in 1.2% (n=2) of iron deficiency anaemia, 76.7% of (n=33) megaloblastic and 40.0% of (n=38) dimorphic anaemia. The macular oedema was not seen in iron deficiency anaemia, whereas in megaloblastic, the results were 2.3% (n=1) and 10.5% (n=10) in dimorphic anaemia. The results were highly significant whether it be the diminution of vision, lid oedema, subconjunctival haemorrhage, disc pallor, retinal haemorrhage or vascular changes and macular oedema ($p < 0.001$).

On looking for various fundus manifestations in different grades of anaemia, we found out the incidence of retinal vascular changes, pale disc, dot blot and flame-shaped haemorrhages, all showed an increase with severity of anaemia ($p < 0.05$).

Hb% (gm/dL)	Grade of Anaemia	Fundus Changes			Percentage
		Present	Absent	Total	
10-12	I (mild)	39	35	66	22.44%
6-10	II (moderate)	56	10	66	22.44%
<6	III (severe)	155	7	162	55.10%

Table 1. Grades of Severity

Types of Anaemia	N=294	Percentage
Iron Deficiency Anaemia (IDA)	156	53.06%
Megaloblastic Anaemia (MA)	43	14.62%
Dimorphic Anaemia (DA)	95	32.31%

Table 2. Distribution of Patients According to Types of Anaemia

	IDA	MA	DA	Total	Percentage	X ²	P value
	156	43	95	294			
Diminution of vision	-	31	54	85	28.91	139	<0.001
Lid oedema	33	-	-	33	11.22	32.9	<0.001
Conjunctival pallor	156	43	95	294	100	NA	NA
Subconjunctival haemorrhage	-	6	12	18	6.12	21.9	<0.001
Disc pallor	15	18	20	53	18.02	24.6	<0.001
Disc oedema	-	-	-	-	-	NA	NA
Retinal haemorrhage	17	23	65	105	35.71	92	<0.001
Vascular changes	2	33	38	73	24.8	120	<0.001
Macular oedema	-	1	10	11	3.74	18.4	<0.001

Table 3. Distribution of Various Ocular Manifestations in Different Types of Anaemia

	Disc Oedema	Pale Disc	Flame-Shaped Haemorrhage	Dot Blot Haemorrhage	Subhyaloid	Roth Spots	Retinal Vascular Change	Macular Oedema
Mild (n=31)	-	2	0	1	-	-	22	-
Moderate (n=56)	-	5	11	8	-	1	26	-
Severe (n=155)	-	46	16	27	15	23	25	11
Total	-	53	30	36	15	24	73	11
X²	-	6.74	3.53	2.45	8.98	5.49	46.0	6.47
P value	-	0.034	0.171	0.294	0.011	0.066	<0.001	0.039

Table 4. Distribution of Various Fundus Abnormalities in Different Grades of Anaemia

DISCUSSION

In present study, conjunctival pallor was the commonest ocular manifestation of anaemia seen in all 100% cases. Retinal haemorrhagic abnormalities were the second commonest ocular manifestation seen in 35% cases. Diminution of vision was seen as the third commonest ocular manifestation seen in 29% of the cases. In a study by Shaheen N. et al,³ conjunctival pallor was the commonest ocular manifestation of anaemia seen in 74% cases, whereas in our study, it was seen in all cases (100%), whereas, they found that retinal abnormalities were the second commonest ocular manifestation observed in 16% cases, and in our study, the percentage was 53.74%.

In a study, Satish S. et al,⁷ conjunctival pallor was the most common finding and was seen in all patients as in line with our study. Flame-shaped retinal haemorrhages was the second most common finding and was seen in 37.50% of patients. Fundal pallor was the third common finding seen in 31.25%. Other ocular manifestations like lid oedema, subconjunctival haemorrhage, papilledema, macular star, cotton wool spot, etc. were less common. Incidence and severity of retinal manifestations was more with more severe grades of anaemia.⁸

In a study, Merin S et al,⁹ they examined 89 patients, out of which, 20 (22.47%) had retinal changes, which were attributed to the anaemia. These consisted of haemorrhages of various forms- round, splinter, flame-shaped, punctate, haemorrhages with pale centers, soft, cotton wool or "hard" exudates, whereas in our study, the percentage of retinal changes was higher upto 35.71% in another study by Holt J.M and Gordensmith¹⁰ who studied 63 patients with anaemia and noted that flame-shaped haemorrhages were the commonest type of haemorrhages. Merin S. and Freund have also found that in severe anaemia, the retinal abnormalities were found in 31.8%, while in moderate anaemia, these were seen in only 13.3%.^{9,2} Kalpana Suresh studied 34 patients with anaemia and found that flame-shaped haemorrhages were common followed by deep haemorrhage.¹¹ Authors also commented that propensity of retinal haemorrhages is more if anaemia associated with thrombocytopenia.^{3,12,13,14}

The occurrence of ocular abnormalities is always directly proportional with the severity of anaemia. We should always keep in mind that ocular changes in anaemia are nonspecific and may closely resemble other conditions, so it is important to rule out other ocular and systemic diseases. Normally, the ocular complications are usually reversible with the correction of anaemia. These patients should be monitored frequently with 3 to 6 months followup evaluation. Small preretinal haemorrhage respond to blood transfusions, while large haemorrhage require posterior hyaloidectomy or vitrectomy to prevent permanent macular damage.

In the fundus of eye, the columns of both arterial and venous blood lie exposed, so that they can be observed through the ophthalmoscope, examined in detail with convenient magnification. Of the various blood disorders, the ophthalmologist is thus often the first witness; but the blood is common to every tissue and its diseases may

present in diverse sites before the patient reaches the haematologist, whose analysis gives the final diagnosis.

CONCLUSION

Commonest ocular manifestation in anaemia is conjunctival pallor followed by retinal haemorrhage and diminution of vision. Ocular abnormalities increases with the increasing severity of anaemia, so all the patients with moderate-to-severe anaemia should always undergo complete eye checkup, so that early diagnosis and timely treatment can be done. Eye being a window to systemic diseases, regular fundus examination can help in judging the severity and gravity of anaemia.

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