



OCULAR CHANGES IN PATIENTS WITH NUTRITIONAL ANAEMIA IN ROHILKHAND REGION

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ABSTRACT **Background:** Occurrence of anaemic retinopathy and conjunctival pallor is common in patients with anaemia. Magnitude of retinal manifestations depends upon the severity of anaemia. Retinal damage in anaemia occurs due to anoxia, venous stasis, angiospasm and increased capillary permeability. **Methodology:** Non interventional study was conducted in 52 adult patients diagnosed with nutritional anaemia in medicine department. Patients with diabetes, hypertension, anaemia other than nutritional causes and media opacities were excluded. After obtaining informed consent ocular examination was carried out with direct ophthalmoscope. Fundus examination was done after dilatation of pupils with tropicamide (mydriatic) eye drops. Patients were examined in more detail in the Ophthalmology O.P.D (whenever possible). **Results:** Conjunctival pallor is the most common finding and is seen in all patients. Flame shaped retinal haemorrhages were the second most common finding and was seen in 38.46% of patients. Deep haemorrhages are the third common finding seen in 30.77%. Other ocular changes like lid edema, subconjunctival haemorrhage, cotton wool spots, vitreous haemorrhages, retinal edema, etc are less common. Incidence and severity of retinal changes is more with more severe grades of anaemia. **Conclusion:** Anaemia can result in wide variety of ocular changes. Patients with conjunctival pallor should be evaluated for anaemia. Patients with moderate to very severe anaemia should undergo mandatory fundus examination for identification of anaemic retinopathy. Incidence and severity of retinal haemorrhages depends on severity of anaemia. Early recognition of retinal manifestation may help in early institution of treatment and thus early resolution of retinal changes.

KEYWORDS : Nutritional anaemia, anaemic retinopathy, Severity of anaemia, fundus examination.

INTRODUCTION

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 and retinal 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 3. This study highlights the occurrence of ocular manifestations in anaemia, relation between incidence of retinal haemorrhages with severity of anaemia and need for fundus examination in anaemic patients.

METHODOLOGY

This non-interventional study was undertaken in the medicine department. 52 patients with nutritional anaemia from age group between 18 to 45 years from department of medicine and were included in this study after obtaining written informed consent. Complete haematological work up was done to exclude patients with anaemia other than nutritional cause. Patients with diabetes, hypertension, anaemia other than nutritional causes and media opacities were excluded. All the patients were examined for ocular manifestations. Patients were examined in more detail in the Ophthalmology O.P.D (whenever possible). Visual acuity in both eyes were recorded with a standard Snellen's chart. Evaluation of anterior segment of eye was done to detect presence of ocular manifestations (like lid edema, subconjunctival haemorrhage, conjunctival pallor) due to anaemia by direct torch light or slit lamp bio microscope. Evaluation of posterior segment of eye was done to detect presence retinal manifestations of anaemia (like venous dilatation and tortuosity, retinal haemorrhages, cotton wool spots and even retinal oedema) with the help of direct or indirect ophthalmoscope after full dilatation of pupil with Tropicamide (mydriatic) eye drops. The details of the patients, type and severity of anaemia along with ocular manifestations consistent with anaemia were recorded.

Data were analysed by using Chi-square test. The p-value of <0.05 was taken as statistically significant.

Table 1: Distribution Of Cases According To Type Of Anaemia.

Type of anaemia	No. of cases	Percentage of cases
Iron deficiency anaemia	28	53.85%
Megaloblastic anaemia	09	17.31%
Dimorphic anaemia	15	28.85%
total	52	100%

RESULTS

Out of total 52 patients with nutritional anaemia iron deficiency is seen in 28(53.85%) patients, megaloblastic anaemia is seen in 9(17.31%) patients and dimorphic anaemia is seen in 15(28.85%) patients.

In this study we found that conjunctival pallor is the commonest ocular manifestation in anaemia and is present in all cases. Diminution of vision is noticed in 4 out of 9 patients (44.44%) of megaloblastic anaemia and 9 out of 15 (60.00%) patients of dimorphic anaemia. Patients with iron deficiency anaemia did not show visual impairment. Lid edema is observed in 5 out of 28 (17.86%) patients with iron deficiency anaemia. It is not seen in patients with megaloblastic and dimorphic anaemia. Subconjunctival haemorrhage is seen in 2 out of 9 (22.22%) patients of megaloblastic anaemia and not seen in patients of dimorphic and iron deficiency anaemia.

Table 2: Distribution Of Ocular Manifestations In Anterior Segment

Ocular manifestation	Iron deficiency anaemia (28)	Megaloblastic anaemia (09)	Dimorphic anaemia (15)	total (52)	percentage
Diminution of vision	00	04	09	13	25%
Lid oedema	05	00	00	05	09.61 %
Conjunctival pallor	28	09	15	52	100%
Subconjunctival haemorrhage	00	02	00	02	03.85%

We also found that retinal haemorrhage is the most common ocular manifestation in posterior segment due to anaemia. Flame shaped haemorrhage are seen in 20 cases out of 52 (38.46%), white centered haemorrhage are seen in 10 patients (19.23%), deep haemorrhages are seen in 16 patients (30.77%). Fundal pallor is the third most common retinal manifestation seen in 15 out of 52 patients (28.85%) with anaemia. Other retinal manifestation like vitreous haemorrhages (9.62% of patients), venous dilatation and tortuosity (5.77% of patients), retinal oedema (3.85% of patients), and cotton wool spots (9.62% of patients) are less commonly noticed on fundus examination.

We also studied correlation between retinal haemorrhages and haemoglobin level in anaemic patients. Patients with mild-moderate anaemia showed retinal haemorrhages in 18.5% of patients. Patients with severe anaemia showed retinal haemorrhages in 68.4% of patients. In our study incidence and severity of retinopathy is more with higher grades of anaemia. The association between anaemia and retinal haemorrhage was statistically significant. Chi-square is used to test the association.

Table 3: Distribution Of Ocular Manifestations In Posterior Segment

RETINAL CHANGES	iron deficiency	megaloblastic	dimorphic	total	percentage
flame shaped haemorrhage	4	6	10	20	38.46%
white centered haemorrhage	0	4	6	10	19.23%
deep haemorrhage	1	6	9	16	30.77%
vitreous haemorrhage	0	3	2	5	9.62%
cotton wool spot	0	2	3	5	9.62%
retinal oedema	0	1	1	2	3.85%
venous dilatation and tortuosity	0	1	2	3	5.77%
fundal pallor	4	5	6	15	28.85%

Table 4: Relationship of retinal haemorrhages with grades of anaemia

Grades of anaemia (Hb in gm%)	No. of cases with retinal haemorrhage	No. of cases studied	Odds ratio	P value
Severe anaemia Hb<7gm%	15	22	4.09	0.02
Mild to Moderate anaemia Hb7-10gm%	5	30		

P statistically significant <0.05

DISCUSSION

Ocular manifestations of anaemia have been increasingly recognized and anaemia of varied reasons can result in different ocular manifestations¹. Nutritional anaemia remains the common haematological abnormality in India. It can occur due to deficiency of iron, folic acid or vitamin B12. Iron deficiency anaemia is the common type of nutritional anaemia. Most patients with ocular manifestation are symptomatic requiring an ophthalmic consultation. Amongst 52 patients, maximum number of cases were of iron deficiency anaemia in our study. In our study vision impairment was noted in patients with megaloblastic anaemia and dimorphic anaemia. Anusha V et al also reported a sudden non progressive loss of vision due to anaemic retinopathy secondary to iron deficiency and megaloblastic anaemia and ocular manifestations were bilateral flame shaped haemorrhage, Roth's spot with cotton wool spot and subhyaloid haemorrhages.

Possible factors resulting in retinal damage could be anoxia, venous stasis, angiospasm and increased capillary permeability in anaemia⁴. Lang GE et al reported that anaemic manifestations are uncommon in eye adnexa structure (like subconjunctival haemorrhage, lid edema etc). Our results are also comparable⁵. Conjunctival pallor and retinal

haemorrhages were the most common finding in our anaemic patients. Lange et al and Nusrat et al also found that conjunctival pallor and retinal haemorrhages were more common in patients with anaemia^{2, 5}. Presence of conjunctival pallor without other information suggesting anaemia is a reason enough to perform haemoglobin estimation⁶. Bilateral retinal haemorrhage are well documented in patients with megaloblastic anaemia^{7, 8}. Flame shaped haemorrhage were common in our study followed by deep haemorrhage and white centered haemorrhages. Holt JM et al studied 63 patients with anaemia and noted that flame shaped haemorrhages were commonest type of haemorrhage⁹. Kalpana Suresh studied 34 patients with anaemia and found that flame shaped haemorrhages were common followed by deep haemorrhage³. Authors also commented that propensity of retinal haemorrhages is more if anaemia associated with thrombocytopenia^{2, 7, 8, 10}. Anoxia, venous stasis, angiospasm and increased vascular permeability results in retinal damage due to hypoxia leading to anaemic retinopathy⁴. Fundal pallor was the third most common retinal manifestations in our study. Other retinal manifestations like venous and arteriolar dilatation, retinal edema, etc were less common. Our study revealed incidence of retinal hemorrhages and magnitude of retinal manifestations has direct relationship with severity of anaemia which is statistically significant and patients with mild anaemia did not show any evidence of anaemic retinopathy. Nusrat et al also found that the retinal abnormalities were more in severe anaemia (34.2%) than in moderate anaemia (7.5%). mild anaemia did not reveal any retinal abnormality². Merin S & Freund have also found in severe anaemia the retinal abnormalities were found in 31.8% while in moderate anaemia these were seen in on 13.3 % of patients¹¹. Ajit et al also commented that severity of retinal manifestations of anaemia depends upon severity of anaemia¹².

CONCLUSION

Conjunctival pallor and flame shaped haemorrhages are most common ocular manifestations in patients with nutritional anaemia. Presence of conjunctival pallor further needs evaluation for presence and severity of anaemia. Patients with moderate to very severe anaemia should undergo fundus examination to diagnose these conditions. Incidence and severity of retinal manifestations depends upon severity of anaemia. Early recognition of retinal manifestation may help in early institution of treatment and thus early resolution of retinal changes.

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