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Ocular Manifestations in Patients with Nutritional Anemia-A Clinical Study.

Angli Manhas[1], Meenakshi Gupta[2], Rameshwar S Manhas[3*], Dinesh Gupta[4], Gaurav S Manhas[5]

[1]Senior Resident, Department of Ophthalmology, Government Medical College Jammu, J&K, India.

[2]Senior Resident, Department of Medicine, Government Medical College Jammu, J&K, India.

[3]Senior Resident, Department of Psychiatry, Government Medical College Jammu, J&K, India.

[4] Professor & Head, Department of Ophthalmology, Government Medical College, Jammu, J&K, India.

[5] Resident Scholar , Department of Radiodiagnosis, Government District Hospital, Ramban, J&K, India.

Corresponding Author: Rameshwar S Manhas, Senior Resident, Department of Psychiatry, Government Medical College Jammu, J&K, India.

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Abstract

Background: A frequent haematological ailment presenting with ophthalmic manifestations is anaemia, can involve any part of the eye but principal features are conjunctival pallor, retinal haemorrhages, retinal arteriolar and venous tortuosity, cotton wool spots, roth's spots, macular star and papilledema.

Objectives: The objective of the study was to evaluate the prevalence of ocular manifestation in nutritional anemia.

Materials & Methods: This present observational study was conducted over a period of 1 year in the out-patient department of medicine & ophthalmology at a tertiary care hospital at GMC jammu. A total of 180 patients, age group ≥15years, diagnosed with nutritional anemia were included in our study. Complete demographic details, history, systemic & ocular examination, relevant investigations were done to exclude patients with anaemia other than nutritional cause. Evaluation of anterior segment of eye was done by slit lamp bio microscope, posterior segment of eye was done with the help of direct/indirect ophthalmoscope/slit lamp biomicroscopy with +90D lens after full dilatation of pupil with Tropicamide+phenylephrene eye drops.

Results: Maximum number i.e.72 were seen in age group of 21-30yrs followed by 58 in 31-40 yrs. Females i.e. 138 outnumbered males (42) in present study. Total of 144 were from rural area. Among all patients with nutritional anaemia iron deficiency constitute 60% patients, megaloblastic anaemia 17.78% patients & dimorphic anaemia was seen in 22.22% patients. Regarding ocular manifestations conjunctival pallor was the commonest ocular manifestation in anaemia and was present in all i.e.100% cases followed by superficial haemorrhages in 104(57.78%).

Conclusion: Anaemia is commonest among females in reproductive age group, iron deficiency anaemia is the commonest nutritional anaemia. Conjunctival pallor and superficial haemorrhages are most common ocular manifestations in patients with nutritional anaemia. Presence of conjunctival pallor needs evaluation for anaemia. Prevalence and severity of retinal manifestations depends upon severity of anaemia.

Keywords: Conjunctival pallor, Females, Nutritional Anaemia, Reproductive age group.

Introduction

All over the world a common prevailing problem is anaemia which is defined as haemoglobin [Hb]concentration in blood below the lower limit of the normal range for the age and sex of the individual. The normal range of Hb conc. is as follows: Men 13 to 16g/d, Women 12 to 14g/dl, New born infants 15g/dl, Children from 6 months to 6years 11g/dl, Children from 6 to 14 years 12g/dl. The major parameter for determining whether or not anaemia is present is haemoglobin conc. whereas the red cell count, haematocrit and absolute values [MCV, MCH and MCHC] provide alternate means of assessing anaemia. In U.S.A. 2 to 10% of people have anaemia. Overall prevalence of anaemia in India is 80 %. Because of regular menstrual bleeding young women are twice as likely to have anaemia than young men. All over the world the commonest cause of anaemia iron deficiency.[1] Anemia is frequent haematological ailment presenting with diverse ophthalmic manifestations.[2] Principal features of anaemia in eye are conjunctival pallor and retinal haemorrhages but can involve any part of the eye.[3] The severity of anaemia is related with severity of conjunctival pallor, retinal haemorrhages, retinal arteriolar & venous tortuosity, cotton wool spots, roth's spots, macular star and papilledema. Substrate are decreased in anaemia which are required for metabolism of retina, thus predisposing to hypoxic injury.[4] The anemic finding can be therefore be taken as indicator for retinal damage presenting as haemorrhage and pallor.[5,6] This study evaluates the prevalence of various ocular manifestations in anaemia, and prerequisite for fundus examination in all patients with anemia.

Material and method: This present observational study involved 180 patients was conducted over a period of 1 year in the out-patient department of medicine & ophthalmology at a tertiary care hospital at GMC jammu . The informed consent from all the participants were undertaken before inclusion in the current study.

Inclusion criteria: Age group ≥15years, either sex, diagnosed with nutritional anemia.

Exclusion criteria: Patient not willing for enrolment, patients with history of diabetes, hypertension, anaemia other than nutritional causes, media opacities, all other diseases causing fundus changes etc were excluded.

After meeting inclusion & exclusion crieteria all the patients underwent following;

Detailed History

Ocular Examination: Visual acuity was recorded in both eyes with a standard Snellen's chart. Evaluation of anterior segment of eye was done by slit lamp bio microscope & posterior segment of eye was done the help of direct/indirect ophthalmoscope/slit lamp biomicroscopy with +90D lens after full dilatation of pupil with Tropicamide+phenylephrene eye drops.

3.Related investigations i.e, comprehensive haematological work up was done to exclude patients with anaemia other than nutritional cause. Hb estimation was done by Sahli's method. Haemoglobin conc. value is employed as the major parameter for determining whether or not anaemia is present whereas the red cell count, haematocrit and absolute values [MCV, MCH and MCHC] provide alternate means of assessing anaemia.

As per the WHO stipulations, based on the level of Hb conc. anaemia is classified as given below[1]:

Mild anaemia 8 to 12 g/dl

Moderate anaemia 5 to 8 g/dl

Severe anaemia less than 5g/dl

Survival difficulty below 2g/dl

Statistical analysis:The data was analysed using statistical software MS Excel / SPSS version 17.0 for windows. Data presented as number/percentage (%) as discussed appropriate for quantitative & qualitative variables.

Observation & Results

Out of total 180 patients maximum number i.e.72 were seen in age group of 21-30yrs followed by 58 in 31-40 yrs. Females i.e. 138 outnumbered males (42) in present study. Total of 144 were from rural area. Iron deficiency anaemia was seen in 108 followed by megaloblastic anaemia in 32. (Table no. 1)

Among all patients with nutritional anaemia iron deficiency constitute 60% patients, megaloblastic anaemia 17.78% patients & dimorphic anaemia was seen in 22.22% patients. Regarding ocular manifestations conjunctival pallor was the commonest ocular manifestation in anaemia and was present in all i.e.100% cases followed by superficial haemorrhages in 104(57.78%).(Table no. 2)

Lowered oxygen carrying capacity of blood is caused by subnormal level of Hb. This in turn initiates compensatory physiologic adaptations such: Increased release of oxygen from Hb, Increase blood flow to tissues, maintainence of blood volume and redistribution of blood flow to maintain the cerebral blood supply Eventually, however tissue hypoxia develops causing impaired functions of the affected tissues.[1]

Discussion

All over the world, anaemia is a common problem , iron deficiency is the commonest cause of anaemia. Because of regular menstrual bleeding young women are twice as likely to have anaemia than young men.[1]

Anaemia due to multiple reasons may lead to diverse ocular manifestations which have been progressively documented.[2]

In the present study out of 180 patients maximum number i.e.72 were seen in age group of 21-30yrs followed by 58 in 31-40 yrs. Females i.e. 138 outnumbered males (42) in present study.

Anaemia in women are more than young men because of regular menstrual bleeding. In India , this silent emergency is rampant among women belonging to reproductive age group[15-49years] & low socio economic strata of the population. More than 50 % pregnant women are anaemic.[1]

Total of 144 were from rural area in the present study. Iron deficiency anaemia was seen in 108 followed by megaloblastic anaemia in 32. Overall prevalence of anaemia in India is 80 % & the commonest cause of anaemia all over the world is iron deficiency.[1]

Regarding ocular manifestations conjunctival pallor was the commonest ocular manifestation in anaemia and was present in all i.e.100% cases followed by superficial haemorrhages were seen in 104(57.78%). Other retinal manifestations like venous and arteriolar dilatation, subhyloid haemorrhage, etc were least common findings. Venkataraman A et al described ophthalmic manifestations in the form of flame shaped haemorrhage bilaterally, Roth's spot , cotton wool spots and sub hyloid haemorrhages. Probable factors causing retinal injury in anemia might include anoxia, increased capillary permeability, venous stasis and angiospasm.[7] Lang GE et al and Shaheen N et al in their study found that conjunctival pallor and retinal haemorrhages were commonest ocular features in anemic patients.[8,3] Existence of conjunctival pallor without additional evidence suggesting anaemia must be a reason sufficient enough to do haemoglobin estimation.[9]

Retinal haemorrhages in both eyes are reported in patients with megaloblastic anaemia.[10,11] Holt JM et al considered 63 patients of anaemia and found that superficial flame shaped haemorrhages were commonest type of haemorrhage.[12] Suresh K et al in their study of 34 patients with anaemia reported the flame shaped haemorrhages remained common followed by deep haemorrhage. [4] Various studies also observed that tendency of retinal haemorrhages is higher if anaemia is associated with thrombocytopenia.[10-12] Shaheen N et al also stated that the retinal abnormalities were more common in severe anaemia (34.2%) than in moderate anaemia (7.5%).[3] Merin S et al reported that the retinal abnormalities were found in 31.8% in patients with severe anemia while in moderate cases these were noted in on 13.3 % of patients.[13] Majji AB et al also observed that severity of retinal manifestations of anaemia was related to the severity of anaemia.[14]

In moderate to severe anaemia it has been seen that ocular manifestations are more. All the patients were treated according to type of anaemia. In order to prevent nutritional anaemia the Govt. of India sponsored a national nutritional anaemia prophylaxis programme which is based on daily supplementation with iron and folic acid tablets to prevent mild & moderate anaemia. In 1985 commercial production of Iron fortified salt was started. Fortification of salt with iron has been accepted by the Govt. of India as public health approach to reduce prevalence of anaemia.[1]

Conclusion: From present study we may conclude that anaemia is a common health problem in females, iron deficiency is the commonest. Conjunctival pallor and superficial haemorrhages are most common ocular manifestations in patients with nutritional anaemia. Presence of conjunctival pallor needs evaluation for anaemia. Incidence and severity of retinal manifestations depends upon severity of anaemia. Early diagnosis of retinal manifestation may aid in early institution of treatment and thus early resolution of retinal changes.

Recommendations: Authors recommend that awareness regarding intake of balanced diet must be created which plays a key role in prevention . Pregnant woman and children are to be taken care, with supplementation of iron and folic acid it can be prevented easily.

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Table no. 1 Demographic characteristics of studied subjects:

Characteristics	Number of studied subjects
Age (in years)	
≤20	15
21-30	72
31-40	58
41-50	22
≥51	13
Sex	
Males	42
Females	138
Residence	
Rural	144
Urban	36
Type of nutritional anaemia	
Iron deficiency anaemia	108
Megaloblastic anaemia	32
Dimorphic anaemia	40

Table no. 2 Distribution of ocular manifestions in different types of nutritional anaemia

Ocular findings	Iron deficiency anaemia (n=108 i.e 60%)	Megaloblastic anaemia (n=32 i.e.17.78%)	Diamorphic anaemia (n=40 i.e 22.22%)	Total (n=180)
Diminution of vision	nil	16	32	48(26.67%)
Conjunctival pallor	108	32	40	180(100%)
Subconjunctival haemorrhage	02	05	07	14(7.78%)
Lid oedema	07	nil	03	10(5.56%)
Superficial flame shaped haemorrhage	58	20	26	104(57.78%)
Deep retinal haemorrhage	15	18	28	61(33.89%)
Fundus pallor	20	18	34	72(40%)
Roths spots	07	05	14	25(13.89%)
Dilated & tortuous veins	02	02	01	05(2.78%)
Papilloedema	nil	01	03	04(2.22%)
Subhyloid haemorrhage	02	03	04	09(5%)
Cotton wool spots	04	02	04	10(5.56%)
Macular star	01	01	03	05(2.78%)