Nutritional anemia as a cause of vision loss in developing countries: A case report

Abstract
We report the case of a 43 year old male patient who presented with sudden, non progressive loss of vision in the right eye. An ophthalmological evaluation revealed the presence of bilateral flame shaped hemorrhages, Roth’s spots with cotton wool spots with subhyaloid hemorrhage involving the macula in the right eye. Hematological evaluation revealed the presence of iron deficiency anemia with megaloblastic anemia. This case documents the occurrence of anemic retinopathy in dimorphic nutritional anemia and its rapid resolution following treatment with Vitamin B12 and iron.

Introduction
Anemia has varied ocular presentations that include conjunctival pallor, retinal flame shaped or white centred hemorrhages, sub hyaloid hemorrhages, cotton wool spots, dilated retinal veins, disc edema and cotton wool spots. We report a case of a patient with nutritional anemia who presented with decreased vision due to subhyaloid hemorrhage and showed rapid improvement in vision with signs of resolution within a week of correction of the underlying systemic condition.

Case Report
A 43 year old male patient presented to the outpatient department of a tertiary level hospital in Odisha with a complaint of sudden non progressive decreased vision in the right eye of three days duration. There was no history of trauma or long term intake of any systemic medication. He was a vegetarian by diet. He also gave a history of donation of 10 pints of blood over the last 10 years.

On examination, his Best Corrected Visual Acuity (BCVA) in the right eye was 6/36 and in the left eye was 6/6. His anterior segment findings were unremarkable, except for marked conjunctival pallor. Fundus examination showed the presence of flame shaped haemorrhages, with Roth spots and cotton wool spots in both the eyes. Macula of the right eye showed subhyaloid haemorrhage (Fig 1A&B). The intraocular pressure in both the eyes by non contact tonometry was 12 mmHg. Systemic examination revealed no organomegaly. A diagnosis of anemic retinopathy was entertained and he was further investigated for the cause of anaemia.

His haemoglobin level was 4.4 g/dl with a hematocrit of 14.7%. He had an RBC count of 0.80 million / cumm, platelet count of 36,000 /cumm and a total leucocyte count of 4030/cumm. The MCV was 107 fl, MCH 29.7 pg and MCHC was 32.9 gms/dL. His bleeding time, clotting time and prothrombin time were normal. The peripheral blood smear report suggested features of dimorphic nutritional anemia as evidenced by the presence of moderate hypochromasia with moderate to severe anisocytosis with microcytes and macroovalocytes, moderate poikilocytosis with tear drop cells, schistocytes, pencil cells and pessary cells, hypersegmented neutrophils and thrombocytopenia. A value of 179 pg/ml on serum Vitamin B12 assay confirmed the diagnosis of a co-existent megaloblastic anemia with iron deficiency anemia.

He was treated with 2 pints of packed cell transfusion with intravenous vitamin B12 injection 1000 µg daily for 5 days, then every week intravenously for 1 month, then was advised to take injections once every 3 months for 2-3 years. Iron supplementation was also instituted. His haematological parameters improved. After one week of treatment, the laboratory parameters were as follows: haemoglobin 8.6 g/dl, total leucocyte count 5800/mm3, platelet count 100,000/mm3. The vision in the right eye had also improved to 6/18 with the subhyaloid hemorrhage showing signs of resolution. At one month follow up, his vision improved to 6/9 with resolution of the subhyaloid hemorrhage and stabilization of the hematological parameters (Figure 2).

Discussion
The pathogenesis of anemic retinopathy has been attributed to factors such as anoxia, venous stasis, angiopasm and increased capillary permeability with a higher prevalence in patients with Hb< 6g/dl. The co-existence of thrombocytopenia is known to be associated with a more severe manifestation. The co-existence of thrombocytopenia in vitamin B12 deficiency, as noted in our case, is due to impaired DNA synthesis leading to ineffective thrombopoiesis. Vitamin B12 deficiency is also known to be associated with hemorrhagic
manifestations as bleeding from skin, subcutaneous tissue, epistaxis and even threatening haemorrhage from gut as well as intracerebral bleed, requiring emergency blood transfusion. The response to vitamin B12 in such cases is dramatic with rapid resolution of ocular hemorrhages and stabilisation of hematological parameters. The only source of vitamin B12 being of animal origin i.e, egg, fish and dairy products, pure vegetarians are prone to develop this deficiency. The occurrence of iron deficiency anemia along with megaloblastic anemia in our patient was further worsened by repeated blood donations.

Very few cases of retinopathy due to megaloblastic anemia have been reported from India. Megaloblastic anaemia induced retinopathy has also been reported from Africa and in alcoholics due to the combined deficiency of folate and Vitamin B12. The purpose of this report is to highlight the occurrence of anemic retinopathy due to nutritional deficiency in developing countries. This case, may represent just the tip of the iceberg, and hence calls for establishment of stringent screening protocols for the identification of nutritional anemia in developing countries and mandatory fundus examination of the identified subjects for anemic retinopathy. This report also re-iterates the fact that ophthalmic manifestations of anemic retinopathy do not need any specific treatment other than systemic management.

References


Dr.Anusha Venkataraman cleared her MD (ophthalmology) from Dr.R.P.Centre for ophthalmic Sciences, AIIMS, New Delhi and was awarded the Gold medal for the best post graduate in ophthalmology. She also completed 3 years of senior residency at Dr.R.P.Centre, AIIMS in Vitreo-Retina, Trauma and ROP services. She is currently working as Asst. Prof. at All India Institute of Medical Sciences, Bhubaneswar.