INTRODUCTION

Valsalva maculopathy is a rare condition characterized by preretinal haemorrhage in patients with a history of increased intrathoracic pressure caused by forceful exhalation against a closed glottis. Thomas Duane first described it in 1972. Immediately following a Valsalva maneuver, a sudden rise in intraocular venous pressure causes retinal capillaries to spontaneously rupture. The clinical sign of valsalva retinopathy is a circumscribed, round or dumbbell-shaped, bright red mound of blood beneath the internal limiting membrane or near the central macular area. Management of valsalva retinopathy is conservative as recovery of normal vision with spontaneous reattachment is the rule.

CASE REPORT

A 25 year old male patient reported to the eye department CMH Okara with sudden painless loss of vision in both eyes for the last 1 day. He was undergoing a physical efficiency test during which he ran 2 miles, then climbed 4 beams, did 55 sit-ups followed by 25 push ups within a span of 1 hour in this sequence. He noticed sudden painless deterioration of vision in right eye while he was climbing the beam. He ignored the problem and continued with the exertion. While doing the sit-ups he developed sudden painless deterioration of vision in left eye also but continued with the exertion. The vision did not further deteriorate in both eyes till completion of the physical test. According to the patient he could not see the central objects in line of his vision but could see the peripheral objects.

There was no previous H/O trauma or headache. The patient has no cardiac, respiratory problem or any haemorrhagic disease. The patient was not on any medication prior to this episode.

His general physical examination revealed an afebrile young man of average build, conscious and oriented with a pulse of 76/min blood pressure of 120/75 mmHg, and respiratory rate of 17/min his BMI was 21, examination of chest, heart, abdomen and CNS revealed no abnormality.

Ocular examination revealed a VA of 6/36 in right eye and 6/24 in left eye which did not improve with pin hole. There was no abnormal finding on anterior segment examination. Fundus examination revealed a bright red circumscribed mound of blood over the macula in Right Eye (Fig 1). The fundus examination of left eye revealed a similar lesion but slightly lesser in extent. Intraocular pressure measured by Goldman applanation tonometer was 16 mmHg in both eyes.

The patient was managed conservatively. He was advised to avoid exertion. Followup at 3 weeks revealed a VA of 6/18 in right eye and 6/9 in left eye. Followup at 5 weeks revealed a VA of 6/12 in both eyes and showed remarkable visual recovery with return of vision to normal in both eyes after 12 weeks.

ABSTRACT

Valsalva retinopathy is a rare condition characterized by preretinal haemorrhage in patients with H/O increased intrathoracic pressure caused by forceful exhalation against a closed glottis. We are presenting a case of a young male adult who developed bilateral valsalva retinopathy following strenuous exercise. Examination of his fundus revealed a round, circumscribed bright-red mound of blood over both maculae. The extent of the lesion in left eye was lesser than the right eye. He was managed conservatively and showed remarkable visual recovery with return of vision to normal in both eyes after 12 weeks.

KEYWORDS: Valsalva, Macula, Haemorrhage
right eye and 6/6 in left eye. The lesion in right eye had reduced in size (Fig 3) while that in left eye was faintly visible. Followup at 12 weeks revealed a VA of 6/6 in both eyes. Fundus examination in RE revealed a minute yellowish spot over the macula whereas macula in left eye was normal.

**DISCUSSION**

Increasing intrathoracic pressure against a closed glottis diminishes venous return to the heart, decreasing stroke volume and subsequently increasing the venous system pressure. The process occurs in four separate and distinct phases. First, a sudden increase in intrathoracic pressure decreases venous return to the right side of the heart. Second, diminished cardiac filling lowers the mean arterial pressure, slowing the pulse, leading to reflex tachycardia and peripheral vasoconstriction. Third, release of the strain causes a prompt reduction in the intrathoracic pressure, further lowering the blood pressure and simultaneously increasing the cardiac pressure. Finally, an abrupt increase in blood pressure occurs as venous blood surges back to the heart, inducing reflex bradycardia. During a Valsalva maneuver, blood pressure in the peripheral portions of the body increases rapidly. As the sudden rise in intraocular venous pressure occurs, a spontaneous rupture of retinal capillaries ensues.

Valsalva retinopathy occurs following a Valsalva maneuver. Reported causes of a Valsalva maneuver include straining and physical activities, most commonly during the following: coughing, weight lifting, vomiting, bungee jumping, aerobic exercise, sexual activity, end-stage labor, colonoscopy procedures, fiberoptic gastroenteroscopy, constipation, blowing musical instruments, and compressive injuries. Visual loss may result from haemorrhagic detachment of the internal limiting membrane, preretinal haemorrhage, vitreous haemorrhage or dissection of blood beneath the retina. Gass has described a circumscribed, round or dumbbell-shaped, bright-red mound of blood beneath the internal limiting membrane in or near the central macular area. Part of the blood may turn yellow after several days. Serous detachment may replace the resorbing blood. Recovery of normal vision with spontaneous reattachment is the rule.

Preretinal haemorrhage, either spontaneous or associated with exertional activity, has also been described in individuals who have tortuosity of second and third order retinal arterioles in familial retinal arteriolar tortuosity. However no specific haematologic disorder has been described in this entity, which is probably inherited as an autosomal dominant trait.

Lab studies can be used to rule out predisposing risk factors, including diabetes, sickle cell disease, anemia, idiopathic thrombocytopenic purpura, and other blood dyscrasias. Important tests include, complete blood count, fasting blood sugar, glucose tolerance test, prothrombin time, activated partial
thromboplastin time, hemoglobin electrophoresis, antiphospholipid antibodies and urine analysis.

Retinal photographs can be useful to monitor the progression and the resolution of retinal hemorrhages over time. Retinal fluorescein angiography can be used to determine the location of active leakage if neovascularization is suspected secondary to an underlying medical problem. If blood in the vitreous is obstructing the view of the retina, B-scan ultrasonography can be used to screen for a retinal break or detachment. Optical coherence tomography (OCT) has been used to view the exact location of a premacular hemorrhage (under the internal limiting membrane). Blood pressure measurement is an essential ancillary test to rule out hypertension as a predisposing risk factor. Preretinal hemorrhages lie just under the internal limiting membrane and in front of the nerve fiber layer. They arise from the superficial capillary bed. As the hemorrhage resolves over time, the blood typically settles at the bottom of the internal limiting membrane of the retina in a D-shaped pattern. Very specific color changes are associated with resolution: red to yellow and yellow to white. Upon complete resolution of the hemorrhage, retinal function is typically unaffected. Valsalva retinopathy has a predilection for the macula. The perifoveal capillary bed is presumably targeted because of its detailed structural architecture.

Conservative medical treatment is observation. Preretinal hemorrhages secondary to Valsalva retinopathy usually resolve by themselves in a few weeks to a few months. Vitreous hemorrhages may take longer to resolve, possibly up to 6 months. During recovery phase, patients should be instructed to avoid anticoagulant medications and strenuous activities to prevent a rebleed.

Patients should be instructed to sleep in a sitting position to promote blood settling, which may improve visual acuity. However, this effect may be transient upon resumption of physical activities. While there is no widely accepted treatment modality other than observation, in the last few years, Nd:YAG laser membranotomy and Krypton laser membranotomy have been pushed to the forefront for the treatment of large (>3 disc diameters in size) macular subhyaloid hemorrhages of less than 3 weeks' duration. The membranotomy causes immediate drainage of the hemorrhage into the vitreous cavity, which causes the blood to quickly fall with gravity into the inferior vitreous and out of the visual axis, prompting a rapid return of central visual acuity. Pulsed Nd:YAG lasers, krypton lasers, argon lasers, Q-switched Nd:YAG lasers, and frequency doubled Nd:YAG lasers have all been used for disruption of the posterior hyaloid or the internal limiting membrane.

While lifting heavy objects, patients should be advised not to hold their breath for extended periods of time and to take multiple breaths between bearing-down phases. Exhaling while lifting or straining prevents a Valsalva maneuver because one cannot exhale against a closed glottis. Straining during bowel movements should be avoided. Stool softeners may need to be considered for those with constipation.

REFERENCES