Chorea disclosing deterioration of polycythaemia vera

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Abstract

Neurological manifestations occur frequently in polycythaemia. Chorea, however, is a rare complication of the disease. A case of chorea in a patient previously diagnosed with polycythaemia vera is reported. Choreic movements started after measurement of haematological variables showed deterioration. It was considered that this was caused by inappropriate treatment with iron because the chorea was markedly reduced after the two first venesections and normalisation of the packed cell volume and haemoglobin parameters.
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Polycythaemia has gained the dubious distinction of being a haematological disorder with an inordinately high occurrence of neurological complications, which range from migrainous headaches and vertigo to much rarer complications such as extrapyramidal syndromes.[1 2] Among the latter, chorea has been reported most frequently.[3 4] The pathogenesis of polycythaemic chorea still is a subject of speculation.[5 6] We present a patient in whom chorea was the presenting symptom of a deterioration of the myeloproliferative disorder.

Case report

A 74 year old woman was admitted to hospital for investigation of involuntary movements involving the face, trunk, and limbs that had suddenly developed four days earlier.

General examination showed facial erythrosis but no splenomegaly. Blood pressure was 150/70 mm Hg and temperature was 36.5 °C. The patient presented choreic movements involving limbs, trunk, and the orofaciolingual muscles with writhing movements of the tongue, grimacing, grunting, and a moderately severe dysarthria. There were marked choreic movements to the trunk leading to a lurching gait. Choreic movements were extremely violent so that restraint was required to prevent injury. The limbs were hypotonic with diminution of tendon reflexes. Her mental status was normal and neurological examination showed no other abnormality. The fundi were normal.

The patient had been diagnosed with a myeloproliferative disorder, polycythaemia vera, 10 years before and she had regular haematology follow up. Her general practitioner started treatment with iron two months before. There was no family history of chorea or dementia and she was not being treated with chorea inducing drugs.

Laboratory investigations confirmed the diagnosis of polycythaemia according to current Polycythemia Vera Study Group guidelines. Before iron treatment her red blood cells were 6.43×10^{12}/l, haemoglobin concentration 117 g/l, packed cell volume 0. 46, and platelet count 552×10^{9}/l. At the onset of the choreic syndrome red blood cells were 7.60×10^{12}/l, haemoglobin 168 g/l, packed cell volume 0.64%, red cell volume 48.4 ml/kg (predicted normal 26.7 ml/kg), mean corpuscular volume 84.6 fl, white cell count 25×10^{9}/l, and platelets 474×10^{9}/l. Her oxygen saturation was 90%, leucocyte alkaline phosphatase 366 U/l, vitamin B12 1770 pmol/l (reference range 150–700 pmol/l), and iron 4.8 μmol/l (reference range 6.6–32.2 μmol/l). Bone marrow examination showed global hyperplasia without fibrosis. Serum erythropoietin was <4 mU/ml (normal 5–20). Results of the following investigations were normal: uric acid and calcium concentrations, liver and thyroid function tests, tests for syphilis, HIV and chest radiograph, cerebrospinal fluid parameters, and cranial magnetic resonance imaging.

After four venesections (about 250 ml each) the choreic movements were markedly reduced and slight residual chorea was controlled with oral haloperidol 3 mg/24 hours. Haloperidol was progressively withdrawn and stopped in three weeks without chorea reappearing.

Improvement in the clinical picture was simultaneous with normalisation of haemoglobin and packed cell volume.

Discussion

Neurological manifestations of polycythaemia vera occur frequently (50%–78%) and include headache, vertigo, stroke, visual symptoms, tinnitus, and paresthesia.[2] Chorea, however, is a rare and infrequently reported complication of the disease (0.5%–5%).[3 4 6]

There is a clear relationship between the onset of chorea and haematological values worsening in the patient reported (probably caused by inappropriate iron treatment). Before iron treatment her packed cell volume was 0.46 and haemoglobin 117 g/l and at the onset of the polycythaemic chorea 0.64 and 168 g/l, respectively. Polycythaemia and chorea improved rapidly with venesections and follow up showed no recurrence of polycythaemia or neurological symptoms.

Pathophysiology of chorea due to polycythaemia is far from clear.[5 6] Blood hyperviscosity reducing and impairing oxygen transport, particularly in the basal ganglia, probably plays an important part in the pathogenesis.[5] The most important determinant of the viscosity of whole blood is the packed cell volume, and an inverse relationship can be shown between cerebral blood flow and packed cell volume.[7] Platelet

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Box 1: Neurological complications in patients with polycythaemia[2 6]

- Headache: 41%
- Dizziness or vertigo: 30%
- Paresthesias: 13%
- Visual: 11%
- Stroke: 9%
- Tinnitus: 3%
- Extrapyramidal syndromes: 0.5%–2.5%

Box 2: Learning points

- The onset of a choreic syndrome in patients with polycythaemia can alert us about deterioration in the packed cell volume and haemoglobin values
- Polycythaemia chorea must be considered because this diagnosis leads to effective treatment and prevention of serious complications—for example, deep vein thrombosis, pulmonary embolism, and stroke

contact and adhesion to the vessel wall are increased at a high packed cell volume value,[8] but the specific effect of the level of the platelet count in polycythaemia vera is more difficult to analyse because the packed cell volume has an apparently dominant role.[7] The relative stiffness of iron deficient red cells could influence in the pathophysiology of chorea. It has been inferred from viscometric studies that red blood cell deformability might be reduced in iron deficiency,[9] and the effect of iron deficient red cell changes on whole blood viscosity has been assessed at a wide range of standardised packed cell volumes.[10] The female preponderance (postmenopausal oestrogen deficit) and an underlying individual predisposition had also been discussed.[5]

Most cases of polycythaemia chorea have occurred in elderly women, usually with acute onset or sudden aggravation. In some cases chorea is the presenting symptom of polycythaemia vera. The choreic syndrome is usually generalised with predominant involvement of the orofaciolingual muscles, but it might be unilateral.

It is important to note that the onset of a choreic syndrome in patients with diagnostic criteria of polycythaemia vera can alert physicians to a deterioration in haematological variables. Polycythaemic chorea must be considered, especially in the elderly, because this diagnosis leads to effective treatment and the prevention of deep vein thrombosis, pulmonary embolism, stroke, and other serious complications.

Learning points are shown in boxes 1–3.

Box 3: Possible causes of chorea

- Developmental and aging choreas: physiological chorea of infancy; cerebral palsy-anoxic; kernicterus; minimal cerebral dysfunction; buccal-oral-lingual dyskinesia and edentulous orodyskinesia; senile chorea
- Hereditary choreas: Huntington's disease; benign hereditary chorea; neuroacanthocytosis; olivopontocerebellar atrophy; Machado-Joseph disease; ataxia telangiectasia; tuberous sclerosis; Hallervorden-Spatz disease; Friedreich's ataxia; familial calcification of basal ganglia; neurometabolic disorders: Wilson's disease, Lesch-Nyhan syndrome; lysosomal storage disorders; amino acid disorders; Leigh's disease; porphyria
- Drug induced neuroleptics (tardive dyskinesia): antiparkinsonian drugs; amphetamines; cocaine; tricyclics; oral contraceptives
- Toxins and alcohol intoxication and withdrawal: anoxia; carbon monoxide; manganese; mercury; thallium; toluene
- Metabolic: hyperthyroidism; hypoparathyroidism; chorea gravidarum; hypernatraemia and hyponatraemia; hypomagnesaemia; hypocalcaemia; hypoglycaemia and hyperglycaemia; acquired hepatocerebral degeneration; nutritional (for example, beriberi, pellagra, vitamin B deficiency in infants)
- Infectious: Sydenham's chorea; encephalitis lethargica; various other infectious and postinfectious encephalitides, including Creutzfeldt-Jakob disease
- Immunological: systemic lupus erythematosus; Henoch-Schönlein purpura; others (rarely):sarcoidosis, multiple sclerosis, Behçet's disease, polyarteritis nodosa
- Vascular: infarction; haemorrhage; arteriovenous malformation; moyamoya disease; polycythaemia vera; migraine
- Tumours
- Trauma: including subdural and epidural haematoma
- Miscellaneous: including paroxysmal choreoathetosis

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