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Emergencies in Parkinsonism

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1. Abstract

Patients with Parkinsonism may present acutely to the ED with serious and even life-threatening conditions. Although falls are a common presentation in advanced Parkinsonism, early presentations with falls should alert the clinician that the patient might have a Parkinson syndrome other than Parkinson's disease itself, including autonomic neuropathy causing orthostatic hypotension. Patients may present with neuroleptic malignant syndrome, acute psychosis, marked hypokinesis, freezing gait, aspiration pneumonia, dysphagia, serotonin syndrome, dopamine dysregulation syndrome and intestinal pseudo-obstruction. An inpatient admission is necessary for investigation and observation of these patients. We present a case of a patient who presented with an uncommon side effect of a common medication used for Parkinsonism.

2. Case Report

A 60-year-old man presented with weakness leading a fall and subsequent fracture of his left arm. His medical history was significant for Parkinsonism, diagnosed at the age of 50. He was being followed-up regularly by a movement disorder specialist every three months. His medications included levodopa/carbidopa 750 mg daily, rotigotine dermal patch 6 mg daily and amantadine 300 mg daily for one year. He started to develop motor fluctuations of delayed 'on' and unpredictable 'off' periods and painful dyskinesia. The patient's partner reveled to his specialist that he had also started to develop non-motor symptoms of a Rapid Eye Movement disorder, where the patient started to enact his dreams by punching his partner. Clonazepam did not improve his symptoms, but melatonin did to moderate effect. The patient started to experience gait freezing and dyskinesia, so rotigontine was ceased and levodopa/carbidopa was increased to one gram daily. A MAO inhibitor and COMT inhibitor were added with no improvement. 18 months ago, he was started on intermittent apomorphine SC by his specialist with significant symptomatic improvement. He was subsequently started on a continuous infusion of apomorphine 4mg/hour 6 months later. His sleep improved significantly. When he presented to the ED, examination by an Advanced Trainee revealed that the 'pull-test' was positive and the patient looked jaundiced and pale. The remainder of the examination, including the chest, abdomen, lymph nodes, muscles and joints, were unremarkable. There was no postural hypotension, no tremor, and no rigidity. The patient had a chest X-ray and an ECG which showed no abnormal findings apart from fracture in the left clavicle. An orthopedic Registrar reviewed the patient and advised for symptomatic management of Parkinsonism. A movement specialist nurse advised for the patient to continue on the same medications. In the ED, the Haemoglobin was 7 grams/DI, Haematocrit 19, MCV 95, Platelets 190, AST 30, total bilirubin 4, and unconjugated bilirubin 3. The patient was given 3 units of packed red cells. Gastroenterology booked the patient for an upper and lower endoscopy the following day, which did not show any signs of bleeding. On Day 3 the Senior Registrar received a call from haematology. They informed the treating team that the patient had a high LDH, low haptoglobin and spherocytosis on the blood film. Serum electrophoresis did not show clonality. Serum B12, folate and copper were normal. Methylmalonic acid, homocysteine, zinc levels, immunoglobulin, immunophenotyping, the kappa/lambda ratio, flow cytometry, serum nitric oxide, and G6PD levels were also normal. Haemoglobin electrophoresis

showed normal HbA2 and no evidence of thalassemia or sickle cell anemias. An immune screen, including ANA, ENA, Coombs' test, Anti-Scl-70, Anti-RPN, rheumatoid factor, complement, anti-CCP, and an anti-synthetase screen were all either negative or normal. A CT head, neck, chest, abdomen, pelvis, and ultrasound of the testes were also all normal. The patient was reassured and sent home with plans for a follow-up with his specialist and the orthopaedic team as an outpatient. The patient's specialist advised for the patient to continue on his medication for Parkinson's as it appeared to be working well to control his symptoms. Two weeks later, the patient presented to the ED after having another fall. The cause of the fall was unclear. His Haemoglobin had dropped to 5 grams/DI, and the patient had an elevated AST, LDH and unconjugated bilirubin. The haematology registrar was called to look at the peripheral blood film, and he confirmed that the patient had a hemolytic anemia. In consultation with his consultant, the registrar advised to send the patient to the haematology department for consideration of a bone marrow biopsy. The patient's movement disorder specialist advised for him to continue taking the same medication. The patient was reviewed by cardiology who advised that the patient should continue on telemetry and should arrange for a transthoracic echocardiogram. Four units of packed red cells were infused. The patient later had a bone marrow biopsy which showed normal erythropoiesis. An echocardiogram was performed which showed normal muscles and valves, and there was normal cardiac systolic and diastolic function. The patient was eventually seen by the consultant hematologist who examined the patient and his blood film diagnosed them with drug-associated bite cell hemolytic anemias. His medication was reviewed by the pharmacist and immunologist, who agreed that the patient had a hemolytic anemia due to apomorphine. The apomorphine was ceased in consultation with his specialist. The patient was seen by his neurologist and specialist nurse. In consultation with the patient, it was decided that the patient was to receive levodopa/carbi-dopa intestinal infusion gel. The patient had a percutaneous endoscopic gastrostomy into the jejunum with 2 grams of levodopa and 500 mg carbidopa. Patient complications such as dislodgement of the jejunal tube, catheter migration, bezoar formation, intestinal obstruction, abdominal pain, flatulence and constipation were all explained to the patient.

The patient was discharged home with plans for outpatient rehabilitation and follow-up with a specialist Parkinsonism nurse. 10 months later, the patient attended the ED because he could not feel his legs and had had a fall. The patient was admitted to an acute assessment unit. They were seen by neurology, who performed an EMG and diagnosed the patient to have a peripheral sensory neuropathy.

His blood tests confirmed the patient had a haemolytic anaemia, however there was no clear cause to explain the haemolysis. The patient was transfused with 3 units of packed RBC. His serum B12 was 12 (300-600), folate was within normal limits and homocysteine and MMA were elevated. A bone marrow biopsy confirmed presence of hyper-segmented neutrophils. Lupus screens, copper levels, zinc levels, faecal elastase and coeliac screens were all either negative or normal. An MRI of the spine showed signal in the upper thoracic region which was compatible with B12 deficiency. A repeat upper endoscopy with multiple biopsies did not reveal any sign of atrophic gastritis or coeliac disease. The patient was reviewed by a dietian who confirmed that the gastrojejunostomy tube was a recognized cause of B12 deficiency. The patient was started on an injection of hydroxycobalamin. The registrar called for an interdisciplinary round with all physicians involved in the patient's care, to further discuss the patient's future management. Advice from a movement disorder specialist was sought to discuss options for devices to assist medication delivery. The patient was tried on a continuous apomorphine infusion and carbidopa/levodopa intestinal gel via a percutaneous gastrostomy tube. The last option was deep brain stimulation which usually works well for tremor dominant Parkinsonism and is a good way to reduce the need for medications. The patient and family decided to continue on the continuous apomorphine infusion and indefinite B12 injections.

3. Acute Presentations of Parkinsonism

Most complications are either associated with the progress of Parkinson's disease or side-effects of the medication. Many of these complications can be dealt with in an outpatient clinic, but it is not uncommon for a patient with Parkinsonism to present to the ED for urgent management and inpatient admission. Dyskinesia is a very common complication which occurs at peak dose of medication, or during a prolonged "off" [1] or delayed "on" periods. It is often managed in the outpatient setting. Patients may also experience symptoms such as visual hallucinations and rarely auditory hallucinations, paranoid delusions, weight loss, agitation and a hyperactive delirium. An inpatient admission and assessment is very important to consider reduction of medications such as anticholinergics, mono-amine oxidase inhibitors, dopamine agonists, COMT inhibitors, levodopa, and all other dopaminergic, opioid and tricyclic antidepressants. Atypical antipsychotics such as quetiapine or clozapine should be introduced in conjunction with a psychiatrist and a movement disorder specialist [2-4]. Typical antipsychotics may precipitate neuroleptic malignant syndrome. A cholinesterase inhibitor may reduce visual hallucinations and psychosis [5] impulse control problems, and dopamine dysregulation syndrome. Urgent involvement of a movement disorder specialist to reduce dopamine agonists, device-assisted medications such as continuous apomorphine infusions, levodopa–carbidopa intestinal gel or deep brain stimulation of the subthalamic nucleus may be of benefit [6].

4. Dysphagia Causing Severe Malnutrition and Aspiration Pneumonia

An inpatient admission for video fluoroscopy and involvement of an allied health specialist such as a speech therapist to discuss device-assisted therapy may be required to assess dysphagia. Intestinal pseudo-obstruction and paralytic ileus, may be considered after excluding organic obstructions. Prokinetic medications may be an alternative treatment. Dopamine inhibitors should be avoided.

5. Syncope Due to Orthostatic Hypotension

Patient admissions are mandatory to review medications and withhold any medications which may cause orthostatic hypotension, such as dopamine agonists, monoamine oxidase inhibitors and any antihypertensive medication. Fludrocortisone or midodrine may also be considered to raise the blood pressure [7].

6. Parkinsonism-Hyperpyrexia Syndrome

Akinesis and fever may occur due to medication non-compliance. Complications may include acute renal failure, aspiration pneumonia and venous thromboembolism. Management involves dopaminergic drug administration, treating symptoms, and preventing complications of disease [8]. The patient should be managed in the ICU with continuous monitoring. Multidisciplinary care should be provided. Refractory cases may require oral sodium dantrolene and bromocriptine, intravenous amantadine, and in refractory cases, pulsed methyl-prednisolone [8].

7. Serotonin Syndrome

Patients with Serotonin Syndrome usually present with severe akathisia, myoclonus, mydriasis, diarrhoea, fever, confusion and hypertonia. It usually occurs following administration of a MAO-inhibitor, tricyclic antidepressant or morphine. Hyper-serotonin syndrome is due to stimulation of postsynaptic serotonin. Patients should receive medical care in the ICU [9].

8. Falls

Falls are a serious complication of medications, reduced mobility, orthostatic hypotension, impaired postural reflexes and increased 'off' periods due to progression of disease [10], such as rigidity and gait 'freezing'. Patients may develop serious fractures. Falls are a common cause for admission to a residential home as patients often need 24-hour care following falls [11].

9. REM Sleep Disorder

Rapid eye movement sleep disorder is characterised by patients vigorously acting out dreams. This may result in harm to their partner. A small dose of clonazepam may be useful for this.

10. Conclusion

Parkinsonism is a movement disorder disease where patients are cared for by a multidisciplinary team. Although most decisions are made in outpatient clinics, patients commonly present acutely to ED due to falls, serious fractures, medication complications, and disease progression. Despite medications, patients may lose their independence and require ACAT assessment or assessment for residential care [12].

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