Carotid ergotism with retinal ischemia

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Ergot poisoning was first described more than 2,000 years ago with the consumption of food contaminated with mycotoxins. It acquired special importance during the 20th century because of an excessive consumption of ergot pharmaceuticals as symptomatic treatment of migraine.^{1,2}

Recently, the consumption of ergot pharmaceuticals has decreased. However, it has been described that the interaction of ergot medication with other drugs or foods that are metabolized by cytochrome p450 3A4 can lead to ergotism without requiring excessive consumption.¹⁻⁴

We report a clinical case of ergotism triggered by the interaction between dihydroergotamine and grapefruit seed concentrate intake.

Case report

A 33-year-old woman with a history of migraine was admitted to hospital because of fever and hypotension, attributed to urinary tract infection by *Escherichia coli* previously treated with cephalosporins. She had taken one 0.5 mg dihydroergotamine tablet 48 hours before admission and, during the previous days, large quantities—more than 10 times the recommended dose—of grapefruit seed concentrate (3,000 mg/100 mL vitamin C and 400 mg/100 mL natural bioflavonoids). No other toxic consumption was recorded.

After 10–12 hours from admission, the patient developed right eye amaurosis by retinal ischemia secondary to bilateral, progressive, filiform stenosis of both carotid axes, but predominantly right (figure 1), with spontaneous resolution within 24 hours. A duplex ultrasound study of supra-aortic trunks showed normal arterial wall.

A few hours later, pallor along with intense and progressive pain in both lower limbs presented with no pedis and femoral pulses. A thoracic-abdominal-pelvic angio-CT showed filiform stenosis in both iliac and femoral arteries (figure 1) with the presence of renal, liver, and spleen infarctions. Blood test of autoimmune diseases and serologies were all negative. The patient was admitted into the intensive care unit and treated with prostaglandin, pentoxifylline, and IV methylprednisolone. Symptomatic improvement was noticed with the presence of peripheral pulses in less than 24 hours. Fever improved rapidly and complete clinical recovery was achieved in a few days.

The patient was diagnosed with ergotism with vasospasm in carotid and aortic branches with renal, liver, and spleen infarction and retinal ischemia, triggered by the interaction between dihydroergotamine and grapefruit seed concentrate in the context of a febrile syndrome with hypotension.

Complete recovery was assessed by duplex ultrasound study, angio-MRI of supra-aortic trunks, and angio-CT of the thoracic-abdominal-pelvic region, which showed normal results (figure 2), all performed within 3 months of the onset of symptoms.

PRACTICAL IMPLICATIONS

Consider that ergotism can occur without abusive consumption of ergotic drugs due to pharmacologic interaction or interaction with dietary foods or other natural products.

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Figure 1 Imaging at presentation

(A, B) Angio-CT and angio-MRI of supra-aortic trunks show filiform stenosis in both internal carotid arteries, but more pronounced in the right artery. (C) Abdominal and pelvis angio-CT shows filiform stenosis of both iliac and femoral arteries.

Discussion

The main toxic effect of ergotism is vasospasm with special predilection to affect medium caliber vessels of any organ or system but mainly the lower limbs. Carotid involvement is uncommon but it has been described.⁵ Septicemia, as in the case reported, can increase the vasoconstrictor effect of ergotamine.²

Treatment involves discontinuation of ergot medication and, in severe cases, the use of vasodilators, including

prostaglandin E or methylprednisolone as second-line therapy.⁶

Ergotamine has a narrow therapeutic window. Ergot pharmaceuticals are metabolized by cytochrome P450 3A and their bioavailability is increased by inhibitors of that isoenzyme. Foods such as grapefruit are found among p450 3A isoenzyme inhibitors.^{3,4} Thus, overconsumption of grapefruit seed concentrate increased the bioavailability of dihydroergotamine, reaching toxic levels in our patient.

Figure 2 Imaging at 3-month follow-up

(A) Angio-MRI of supra-aortic trunks. (B) A thoracic-abdominal-pelvic angio-CT with normalization of the alterations.

This case report illustrates that a high index of clinical suspicion is necessary for early diagnosis of ergotism. A diagnosis of ergotism should be considered when facing typical angiographic findings (medium caliber vessels bilateral and symmetric filiform stenosis with normality of arterial wall) together with history of treatment with ergot medication, even without excessive consumption. Detailed anamnesis about consumption of isoenzyme cytochrome P450 3A inhibitors is necessary. Complete angiographic resolution after withdrawal of ergot medication will support the etiologic diagnosis, as in our case.

An increased consumption of herbal products for different purposes such as to strengthen immunity, as is the case of grapefruit seed extracts, may be harmful and lead to the appearance of new cases of ergotism.

Author contributions

M. Altuna-Azkargorta: drafting/revising the manuscript, study concept or design, analysis or interpretation of data, study supervision. M. Herrera-Isasi: drafting/revising the manuscript, study supervision. B. Zandio-Amorena: drafting/revising the manuscript, study concept or design, contribution

of vital reagents/tools/patients, acquisition of data. M.C. Bacaicoa-Saralegui: analysis or interpretation of data, acquisition of data.

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