The dialysed patient who turned blind during a haemodialysis session

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Introduction

A number of medical emergencies may be provoked by haemodialysis sessions. We wish to draw the attention of the reader to a rare, but catastrophic, ophthalmic complication of dialysis.

Case report

A 40-year-old non-diabetic woman with unknown primary renal disease had been on regular haemodialysis for 3 years. She suffered from autonomic neuropathy and chronic systemic hypotension (average pre-dialysis blood pressure 95/60 mmHg).

During a routine haemodialysis session, using polysulfone dialyser and bicarbonate buffer, her blood pressure at the end of the 4-h dialysis session decreased to 80/45 mmHg. After haemodialysis had been terminated she suddenly complained of loss of vision in the right eye. Twenty-four hours later the vision was also lost in the left eye and she became totally blind. An ophthalmologist diagnosed giant-cell arteritis. He prescribed methylprednisone 1 g i.v. for 5 days followed by oral prednisone 60 mg/day. Vision did not recover.

The next ophthalmologist noted bilateral fixed dilatation of pupils and normal extra-ocular motility. Dilated fundus examination showed bilateral ischaemic optic neuropathy with oedema of the papillo-macular area. Both central retinal arteries were patent. No neurological deficit was detected. Brain computed tomography was normal and magnetic resonance imaging of the brain showed lesions compatible with white matter disease.

Ophthalmological examination revealed no light perception, bilaterally dilated fixed pupils, bilateral optic atrophy and attenuated retinal vessels as shown in Figure 1. Fundus fluorescein angiogram revealed normal vascular filling, staining of the optic disks and an essentially normal fluorescein angiogram. The electroretinogram was normal as was cerebral angiography.

Subsequently her dry weight was increased by 5% of body weight. Predialysis blood pressure remained around 95/65 mmHg and vision remained permanently lost.

Discussion

The pathophysiology of optic neuropathy in end-stage renal disease is heterogenous affecting patients with profound uraemia and patients on maintenance dialytic therapy. Acute loss of vision in uraemia has been related to oedema of the occipital cortex, a syndrome known as uraemic amaurosis but with prompt dialysis visual function is reversible [1]. In uraemia the optic nerve is susceptible to ischaemia and in two dialysis patients there was significant permanent visual loss from hypotension-induced ischaemic optic atrophy during haemodialysis [2,3]. In the course of haemodialysis, hypotension is the most frequent complication occurring in ~25% of cases and its origin is generally multifactorial. Autonomic nervous system dysfunction is common among the dialysis population due to the...
visual loss is characteristically of sudden onset, not associated with pain or other symptoms [7]. Anaemia is a risk factor predisposing to ischaemic optic neuropathy. Our patient’s low haemoglobin (7.4 g/l) might also have accelerated the course of visual loss.

Ischaemic optic neuropathy in both arteritic and nonarteritic forms is the most common cause of neurogenic visual loss in adults [7]. Our patient had features of the nonarteritic ischaemic optic neuropathy as her blindness was sudden and painless [6]. She did not have any symptoms of giant-cell arteritis or other associated systemic disease. She was not on medications that could cause ocular toxicity. The loss of vision was preceded by profound hypotension. Giant-cell arteritis was suspected by an ophthalmologist and she received treatment with systemic steroids and plasmapheresis without response. In the acute phase it may be difficult on clinical grounds to differentiate between optic neuritis and nonarteritic ischaemic optic neuropathy as the clinical profiles may overlap [7]. No effective treatment is available for nonarteritic ischaemic optic neuropathy. Early aggressive intervention to restore perfusion by increasing blood pressure and haematocrit may result in partial recovery of vision [3]. The natural history of ischaemic optic neuropathy is not fully defined, but in the majority of patients, visual loss is maximal within 24 h. After a follow-up period exceeding 4 months, an overall spontaneous improvement of vision occurs in no more than 16% of cases [7]. In our patient there was no light perception after six months of follow-up.

**Teaching point**

Dialysis patients with arteriosclerotic vascular disease are at the risk of developing ischaemic optic neuropathy during intradialytic hypotensive episodes.

**References**