Unusual association of diseases/symptoms

Polyurethane foam pica in a patient with excessive interdialytic weight gain

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Summary

Maintaining fluid balance in haemodialysis patients is important because of the adverse effects of excessive interdialytic weight gain. This often requires fluid restriction that patients often struggle with. We report a case of a 31-year-old female diabetic patient on haemodialysis with repeated excessive interdialytic weight gains despite fluid restriction and dry weight adjustment. It was subsequently discovered that she devised an unusual, albeit unsuccessful, strategy of eating the polyurethane foam from her dialysis chair while increasing her fluid intake hoping that it would absorb excess water in the gut! This under-diagnosed phenomenon known as pica has been reported in renal patients with substances such as ice, clay and baking soda.

BACKGROUND

Excessive fluid gain between dialysis increases the strain on the heart and is the most important factor for arterial hypertension in dialysis leading to increased cardiovascular morbidity and mortality. Fluid and salt restriction is often used to prevent this but haemodialysis patients sometimes struggle to comply. Poor compliance with fluid and salt restriction is associated with excessive interdialytic weight gain. The underlying reasons are thought to include social, cultural and psychological factors, as well as defective thirst regulation.

Our dialysis patient resorted to rather unusual and intriguing means to maintain fluid balance without complying with fluid restriction. This unfortunately had the opposite effect and contributed to increased weight gain between dialysis.

This case highlights a recognised but under-diagnosed phenomenon in renal patients, known as pica, which is the

compulsive ingestion of non-food substances. While the ingestion of ice, aspirin, clay and baking soda has been reported in haemodialysis patients, this case is unique in that the patient resorted to eating foam from her dialysis chair.

CASE PRESENTATION

A 31-year-old Caucasian woman presented with a background of type I diabetes, end-stage renal failure secondary to diabetic nephropathy and mild learning difficulties. She started haemodialysis via a left arteriovenous fistula in 2004.

She dialyses three times a week for 3.5 hours via a Gambro polyflux dialyser (2.1). She had an average urine output of 300 ml at the start of dialysis, which deteriorated over the following year.

She consistently started dialysis with a large weight excess accounting for up to 10% of her dry weight. She

Figure 1 The patient was eating the foam from the dialysis chair.

would not tolerate longer dialysis or large fluid ultrafiltration, often complaining of muscle cramps towards the end of dialysis. As a result, she would often come off dialysis significantly over her target weight. She also had poor diabetic control with glycosylated haemoglobin of 8.1%.

She was fluid restricted to 500 ml of water a day and was involved in an intense educational programme on how to limit her salt and water intake. Despite several interventions, excessive interdialytic weight gain remained a problem. She also complained of constipation from time to time.

One day (several unsuccessful interventions later), while cleaning her dialysis chair, her nurse noticed that it was 'rather light'. Further inspection revealed that the foam from the chair had disappeared (figure 1). We were surprised to discover that our patient had been eating the foam and had increased her fluid intake with the assumption that it would absorb excess water in the stomach and thus prevent systemic absorption. This was evidently not the case.

INVESTIGATIONS

Table 1 surrogate markers of her nutritional state as well as measures of small solute clearance.

		Normal range
Ferritin	252 µg/l	20–300 µg/l
Vitamin B12	633 pmol/l	130–660 pmol/l
Folate	11.1 nmol/l	8.6–36.3 nmol/l
Albumin	37 g/l	35–50 g/l
Magnesium	1.33 mmol/l	0.7–1 mmol/l
nPCR*	1.42	
Kt/v	1.56	
Urea reduction ratio	0.77	

*Normalised protein catabolic rate.

TREATMENT

She was advised about the ill-effects of eating foam. She received regular dietary advice from the renal dietician with closer family involvement and input from the renal counselor. With laxative treatment, she successfully passed the offending material with no complications.

OUTCOME AND FOLLOW-UP

She continues to dialyse three times weekly and, while compliance with diet and fluid restriction remains an issue, the impact on fluid gain has significantly reduced.

DISCUSSION

The upholstery of a dialysis chair is either fibre or foam filled. In this case, it was made from low-density polyurethane foam. There are few case reports on polyurethane foam ingestion in non-renal patients. The presenting features include abdominal pain, constipation, as in our patient, and intestinal obstruction from bezoar formation. There are no reported cases in renal patients or an association with fluid retention.

The reported causes of pica in renal patients are clay, dirt, aspirin, flour, baking soda and ice.¹ The underlying aetiology is unknown but various theories have been postulated.

The most popular of which is related nutritional deficiency (particularly iron and zinc deficiency). The other theories suggest psychosocial, cultural influences or sensory gratification associated with ingesting these non-food materials (ie, taste, texture, smell) as an underlying cause.²

We could find no clinical or biochemical evidence (see Investigations) to suggest nutritional deficiency in our patient. There were no acute psychosocial triggers for her behaviour and no other reported form of pica. It is likely that having learning difficulties played a role.

Irrespective of the aetiology, the consequences can be severe. These complications vary from direct toxic effects, malnutrition and metabolic derangement to obstructive gastrointestinal symptoms. Large interdialytic weight gain has been noted to occur in haemodialysis patients with pica but a causal relationship has not been conclusively established.^{1 3 4}

In a prospective study by Ward and Kutner¹ looking at haemodialysis patients with pica, those of concern were more likely to be young female patients of African-American origin. The substances involved included starch, dirt and aspirin with two-thirds of cases involving ice ingestion. Fifty-eight per cent of these patients reported excessive interdialytic weight gain. Interestingly, the mean interdialytic weight gain was smaller in patients with ice pica compared to the others.

In contrast, a small case-control study by Obialo *et al*,⁵ which looked at clay pica in haemodialysis patients, showed no statistically significant difference in interdialytic weight gain between case and control.

While the debate lingers as to the exact relationship between pica and fluid gains, this case would suggest that it is worth looking carefully for it in such patients.

Learning points

- Pica can occur in haemodialysis patients.
- Reported offending substances include ice, baking soda, aspirin, clay and now polyurethane foam.
- Renal patients with pica have reported excessive interdialytic weight gain.
- There is a case for assessing patients with excessive fluid gain for pica.

Competing interests None.

Patient consent Obtained.

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Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Iyasere O, Allington Y, Cafferkey M. Polyurethane foam pica in a patient with excessive interdialytic weight gain. *BMJ Case Reports* 2010; 10.1136/bcr.03.2010.2826, date of publication

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