

A febrile tourist with dehydration

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Emergencies can spring up at any time and in many incarnations. Are you adequately equipped to deal with them? Each month we present a case study in emergency medicine based on real cases and events. Would you have been able to help this patient?



Often someone waiting in the local hospital's emergency department will catch your eye while you are working your regular shift there as a GP. This time it is a group of women, some young, others middle aged or older, sitting in triage obviously waiting for one of them to get an examination bed.

A while later the short triage note on your computer screen indicates your next patient is a 63-year-old woman from New Zealand who has had high fevers. There are no other clues. She has been categorised as triage category 2 and, although there is no distress, she is noted to have a temperature over 40°C. You walk down to the triage cubicle and introduce yourself to the group you had noticed earlier. The atmosphere in the group is more what you would expect of girls having a good time out than being in a hospital emergency department.

A quick glimpse at the ambulance log sheet indicates a patient who was shaking with chills and fever. She reported

temperatures of up to 104.9°F. Her family told the ambulance officers that the patient had been becoming increasingly unwell over the past two days. The officers measured her temperature at 40.5°C, and noted that she was normotensive but appeared drowsy and unco-operative, and that there was no pain, vomiting or diarrhoea.

Several girls' nights out

You have learnt, as an experienced GP, that a few moments spent getting to know the patient, and them getting a feeling for you, is often invaluable for diagnosis and later management.

This group quickly involves you in their almost frivolous atmosphere. You find out that the patient, her three daughters and her sister had met to celebrate her birthday. Some serious girls' nights out, with drinking, dancing and singing until early morning, are happily described. It appears that, on arrival from New Zealand three days ago, the patient had experienced a short bout of diarrhoea and muscle pains. The next morning, after a fair bit of dancing and drinking, she had felt dehydrated and unwell, and had stayed in bed until lunchtime. She went out that night and, although not

feeling quite right but being active and strong willed, she had kept up with the rest of her family. The next morning she was not well, and about midmorning she experienced a serious chill and rigors. She stayed in bed and slept. In the late afternoon, her daughters, very concerned, called for an ambulance to take her to the emergency department.

A detailed history, looking for symptoms pointing to a cause of fever or other clues such as overseas travel or exposure to farm animals, reveals nothing. The patient was semiretired, doing occasional cleaning jobs, and usually quite healthy and active.

The patient's past history

Enquiry about the patient's previous history reveals bilateral carotid endarterectomies 12 months ago, hypertension, hypercholesterolaemia and osteoarthritis of her knees and hands. She had also had her gallbladder and her uterus removed.

Her medications include a beta blocker, an ACE inhibitor, a statin and a non-steroidal anti-inflammatory drug.

Investigating the problem

A system review gives no clues despite thorough questioning, including specifically asking about headaches or neck stiffness. You cannot find any signs of drowsiness in this bright, alert and co-operative patient. You do, however, notice some lapses in the accuracy of her details in recent events, especially when compared with the story from the gang.

You again confirm a fever of close to 41°C, but otherwise observations and pulse oximetry are normal (blood pressure, 140/80 mmHg; pulse, 90 beats per minute – but the patient is on beta blockers; oxygen saturation, 97% on room air). The respiratory rate is slightly raised at 26 breaths per minute.

Systematic physical examination reveals no abnormality – no tenderness, respiratory sounds or heart murmurs. A chest x-ray is unremarkable. An urinalysis

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shows some protein, some blood and marked leucocytes.

An asymptomatic urinary infection

You chat with the patient about her asymptomatic urinary tract infection, also telling her that the history of sore muscles and high fevers had raised your suspicions of a viral infection. You start assessing whether it would be possible to have the patient cared for at one of her daughters' homes. Although the white cell count is not raised at $9.5 \times 10^9/L$, you are thinking of giving her a predischarge intravenous injection of gentamicin because of her high fevers. Her haemoglobin is slightly below normal at 110 g/L.

Admission to hospital

While you are attending to another patient a nurse comes to tell you that the woman's blood pressure has dropped to 90/50 mmHg with a pulse of 80 beats per minute. On reviewing her, she seems alert and in no distress. As you put in an intravenous cannula for fluid resuscitation and begin high-flow oxygen therapy by mask, you tell her she may have an infection in her blood and that she should stay in hospital for the time being. Her blood pressure responds to 200 mL of normal saline.

You make sure that the patient's urine sample has gone to the laboratory for culture and sensitivity, and you take blood for cultures. She is given her first dose of intravenous antibiotic therapy (ceftriaxone 1 g [Rocephin]).

The duty medical registrar takes over the process of admitting the patient, notifying the consultant, and so on. You and the patient's family feel less anxious now that she will be in hospital, at least overnight. The family are very grateful.

A week later

Walking through the hospital about a week later, you almost bump into one of the patient's daughters. She greets you

and, somewhat surprised, you ask her what she is doing there. With some amazement that you do not already know, she says that her mother is about to have an operation.

You wonder what you had missed, and try not to think of lawyers. Cautiously, you point out that you usually lose track of patients once they leave the emergency department. Even more cautiously, you ask what operation her mother is about to have. As many a patient's relative, the daughter, although intelligent, doesn't really understand what has gone on. However, she says her mother is having the glands in her neck operated on. You wish her mother well for her operation and depart, determined to find out what is going on.

The story unfolds

From the notes it becomes evident that a saga had unfolded which at some time involved almost every diagnostic department of the teaching hospital.

During the couple of days after admission, the patient had continued to spike high temperatures without any associated hypotension (Figure 1). The duty medical registrar's assessment had agreed with yours completely, as had the consultant's assessment given over the phone that night, although he changed the antibiotics to gentamicin and ampicillin.

The infectious diseases registrar had reviewed the patient the next day and had found her to be drowsy and slightly disorientated. He had also found a new pansystolic heart murmur at the left sternal edge (a possible flow murmur) and some epigastric–right upper quadrant tenderness. His impression was of hypoxia, and a possible collection or atypical pneumonia.

Further tests were performed, including arterial blood gases. These showed a low PaO_2 of 56 mmHg on room air. Further questioning revealed that the patient had had rheumatic fever as a child and that about a year ago she had an episode of sepsis for which no cause was found. She kept two dogs as pets.

Infective endocarditis had been considered as a diagnosis, as well as pulmonary embolism. A cardiac echo, an abdominal CT with contrast and a ventilation/perfusion lung scan had revealed no pathology. The patient had remained febrile, and had complained of marked tiredness and then lower back pain.

The next day it was noticed while assessing all the results that the bloods you had taken on admission showed the patient to be hypercalcaemic (2.83 mmol/L, compared with the normal range of 2.10 to 2.60 mmol/L).

The patient also had polyuria, as shown by the routine fluid balance performed

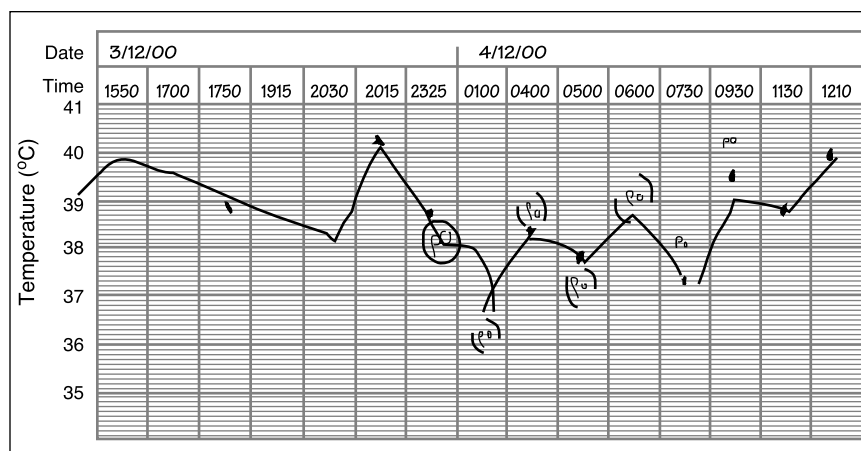


Figure 1. The patient's temperature chart for the two days after admission.

because she was on intravenous fluids. Twenty-four-hour urine collection, bone scan and parathyroid hormone tests had been ordered. Parathyroid subtraction scans and an endocrine consult were also ordered. A bedside family conference had decided that the patient should stay in hospital to see the tests through.

The scan had shown hyperfunction of the left parathyroid region consistent with an adenoma, probably in the lower gland.

In the meantime, an ultrasound had found a cold nodule in the right lower thyroid pole, despite thyroid function tests being normal. Fate was still not on the patient's side. A fine needle aspiration of the thyroid was nondiagnostic.

All the serology for atypical pneumonia had come back negative, as did all the various cultures. Also, her temperature had settled.

The diagnosis

The endocrinologist confirmed a diagnosis of primary hyperparathyroidism and ordered tests specific to calcium metabolism and homeostasis, as well as to investigate the thyroid nodule.

The head and neck surgeons were then involved in the case. The patient gave her consent for a parathyroidectomy and a direct fine needle aspiration of the thyroid nodule.

A successful operation

The operation went well. The 2.5 g parathyroid adenoma (confirmed later by pathology) was removed and direct examination of the thyroid revealed no nodules. Both recurrent laryngeal nerves as well as the remaining parathyroid glands were clearly identified. The patient's postoperative course was good and she was soon discharged.

It would seem the patient had had a urinary tract infection causing the fevers. However, because of the polyuria and fevers, she had become markedly dehydrated and, therefore, at times her blood pressure would drop and she would appear drowsy.

Uncovering silent diagnoses

You are sure that the story of party nights and what they did to her in hospital across the Tasman Sea would be told many times by the patient back home in New Zealand.

You muse with your colleagues in the emergency department how, as greater numbers of older patients present with increased complexity, more tests are routinely done now than in the past. However, it seems that only occasionally – as in this case – is an unexpected important silent diagnosis uncovered. **MT**