can infiltrate the meninges or brain parenchyma and metastasize to bone or infiltrate the epidural space via the intervertebral foramina to cause neurologic dysfunction by compressing adjacent CNS structures. Direct CNS invasion by lymphoma is associated with short survival despite intensive therapy.³ Neurologic dysfunction may develop as a result of infections that occur secondary to immunosuppression, or paraneoplastic syndromes.

Burkitt's lymphoma is an aggressive, rapidly dividing B-cell lymphoma most commonly seen in children. The staging evaluation should be considered a medical emergency, and the patient should receive chemotherapy within 48 to 72 hours after establishing the diagnosis. In the majority of patients, the peripheral blood shows no abnormality. Even when the bone marrow is heavily infiltrated, circulating lymphoma cells are present in less than half of the patients. Among patients with Burkitt's lymphoma,⁴ CNS disease at the time of

diagnosis is associated with the greatest risk of treatment failure. The clinical condition at the onset of treatment is the most important prognostic indicator. The likelihood that decompressive surgery and radiation for spinal metastasis will restore neurological function is minimized if the patients had total weakness of more than 12 hours duration, sphincter loss of more than 24 hours duration, major sensory loss, and uncontrolled metastatic disease elsewhere.⁵

Our patient underwent a laminectomy and received intensive chemotherapy with no improvement in the neurological status. Two weeks after initiation of chemotherapy, he died of neutropenic sepsis.

Final diagnosis

Stage IV Burkitt's lymphoma.

Keywords: tetraparesis; Burkitt's lymphoma

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Hyperthyroidism in an elderly patient

Paul F Findlay, D G Seymour

A 72-year-old woman presented with a 3-day history of increasing breathlessness on effort, orthopnoea, and nocturnal dyspnoea in the absence of chest pain or haemoptysis. She was a life-long smoker of 10 cigarettes per day but her medical history was otherwise without note and she was not taking any regular medication. On examination she was thin, neither anaemic nor clubbed and was clinically euthyroid. The pulse was 150 beats/min, blood pressure 130/90 mmHg. There were signs of biventricular failure with a raised venous pressure, bilateral ankle oedema, bibasal crackles and a left pleural effusion. A 3/6 pan systolic murmur was audible at the cardiac apex with radiation to the left axilla. Routine blood tests, including thyroid function tests, were normal apart from a mild derangement in liver function tests consistent with hepatic congestion. An electrocardiogram revealed atrial flutter with a 2 : 1 AV block and a chest X-ray was consistent with cardiac failure. A subsequent echocardiogram confirmed a dilated cardiomyopathy, severe mitral regurgitation, secondary tricuspid regurgitation and a globally reduced cardiac output. A small pericardial effusion was also noted.

The patient was treated along standard lines with diuretics and an angiotensin-converting enzyme (ACE) inhibitor, and in view of the dilated cardiomyopathy was anticoagulated with warfarin. She was digitalised but the ventricular rate was inadequately controlled with digoxin and amiodarone was introduced. She remained well until she sustained a fall and was admitted to hospital 6 months later. At that time she was clinically euthyroid but routine thyroid function testing revealed a suppressed thyroid-stimulating hormone (TSH) < 0.1 mU/l (normal range 0.35-3.3 mU/l), and a raised thyroxine (T4) of 31 pmol/l (10-25). The auto-antibody profile was negative and a thyroid uptake scan showed reduced uptake at 4.4% (0-35).

Questions

- 1 What is the probable diagnosis?
- 2 How can the condition be treated?

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Answers

QUESTION 1

The probable diagnosis is amiodarone-induced hyperthyroidism.

QUESTION 2

The medical treatment is with carbimazole, and, if clinically indicated, with beta-blockers. In some cases, surgical intervention with total or sub-total thyroidectomy may be preferred.

Discussion

Amiodarone is a Class III anti-arrhythmic agent which is used in the treatment of serious ventricular arrhythmias, paroxysmal supraventricular arrhythmias, atrial flutter and fibrillation. In addition, it may reduce complex ventricular arrhythmias and mortality following acute myocardial infarction and may improve survival in patients with advanced cardiac failure. Amiodarone has a number of well known side-effects (box 1) and can interfere with thyroid function as in this case.

Amiodarone is an iodine-rich benzofuran derivative and 37% of the drug is organic iodine. A maintenance dose of 200–600 mg/day results in a daily intake of organic iodide of between 75 to 225 mg, at least 10% of which is deiodinated to yield free iodine.¹ Since the normal daily requirement of iodine is 0.2–0.8 mg/day,² treatment of any patient with amiodarone results in a massive expansion of the iodide pool which consequently affects thyroid physiology in a variety of ways. Peripheral deiodination of T4 to triiodothyronine (T3) is reduced by enzyme inhibition,³ with a resultant increase in both serum T4 and reverse T3 and a decrease in the serum T3, analogous to a sick euthyroid state. Peripheral uptake of both T4 and T3 is also directly inhibited by amiodarone. Consequently there is a temporary rise in TSH levels which typically return to normal within 3 months. These are expected findings and do not equate with a hyperthyroid state.

The incidence of amiodarone-induced thyroid dysfunction is estimated to be between 2–24%.⁴ Thyrotoxicosis is prevalent in areas with low iodine intake, while hypothyroidism is found typically in areas with a high iodine intake. Thus, amiodarone-induced thyrotoxicosis results from over-production of thyroid hormone induced by iodine. Other mechanisms have been proposed with regard to the pathogenesis of this condition and include a direct cytotoxic effect of amiodarone on the thyroid follicles resulting in destructive changes and an outpouring of iodothyronines. The typical biochemical findings are, therefore, a low TSH, and a high free T4 and free T3.

Although the clinical features may present in a classical fashion with unexplained weight loss, muscle weakness, goitre, and tremor, the features may equally be muted and present in less obvious guises such as increased frequency

Side-effects of amiodarone

- hyper-/hypothyroidism
- photosensitivity
- corneal microdeposits
- pulmonary toxicity
- hepatotoxicity
- peripheral neuropathy
- drug interactions

Box 1

of angina or an unexplained tachyarrhythmia. Thyrotoxicosis can occur throughout the period during which a patient is receiving amiodarone and may be induced even after the cessation of therapy, since the drug has a long half-life.

The treatment of amiodarone-induced hyperthyroidism involves several issues. Consideration should always be given to the option of stopping the drug itself. Clearly this is a clinical decision based on the original indication for the treatment and the merits, or otherwise, of stopping treatment. It is important to be aware, however, that even if treatment is discontinued thyrotoxicosis can take up to 8 months to subside.

The medical treatment of amiodarone-induced hyperthyroidism typically involves carbimazole and beta-blockers. Some sources claim that the use of potassium perchlorate to obtain a prompt release of intrathyroidal iodine, in concert with antithyroid drugs, can achieve a euthyroid state within 90 days.⁵

Controlling amiodarone-induced thyrotoxicosis with medical treatment takes several weeks to be effective and side-effects of drug therapy have to be screened for. In addition, many patients with this condition will have amiodarone discontinued. If this is not an option, or indeed if faster control of the thyrotoxic state is required, surgical intervention with total or sub-total thyroidectomy may be favoured.

Radioactive iodine would not be beneficial since the uptake of radioactive iodine is suppressed by the high iodide concentration resulting from amiodarone therapy.

In summary, treatment with amiodarone can affect thyroid function in a variety of ways. In up to a quarter of patients, clinically relevant thyroid dysfunction results. Therapeutic options include cessation of amiodarone therapy, surgical intervention, if rapid control is required of a thyrotoxic state, or medical treatment. Radioiodine treatment is not an option in amiodarone-induced thyrotoxicosis.

Final diagnosis

Amiodarone-induced thyrotoxicosis.

Keywords: thyrotoxicosis; amiodarone; adverse drug reaction; iodine metabolism

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A case of intestinal obstruction

N P Michell, H Routledge, I M Chesner

A 66-year-old woman was referred with a 2-month history of increasing abdominal pains which were central, colicky and associated with abdominal distension. Her symptoms were worse after food. Over this period she had also developed loose stools 2–3 times per day. She denied weight loss. Medical history included psoriasis complicated by a small joint arthropathy. There had been no previous abdominal surgery and she was taking prescribed slow-release diclofenac and sulphasalazine. On examination she was anaemic with a psoriatic rash on her elbows and shins. The distal interphalangeal joints were deformed. The abdomen was distended, more so on the right, but there were no palpable masses or organomegaly. Bowel sounds were normal. Investigations revealed an iron deficiency anaemia (haemoglobin 8.6 g/dl) and low serum albumin (29 g/dl). Other tests of liver function were normal as were inflammatory markers. An upper gastrointestinal endoscopy and duodenal biopsies were normal. A colonoscopy was performed and three strictures were found in the transverse colon, the most proximal of which could not be passed (figure).

Figure Colonoscopic appearances of the ascending colon.

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Questions

- 1 What do the pictures taken at colonoscopy show?
- 2 What is the likely aetiology of such lesions?
- 3 What gastrointestinal diseases are associated with psoriasis?