

Additional educational resources

British Association of Dermatology (www.bad.org.uk)
Contains clinical guidelines for management
The Skin Site (www.skinsite.com)
The site contains information sheets for patients

Adjuvant therapy

A small randomised trial found that antifungal shampoo (selenium sulphide) increases the rate of eradication, which may reduce the transmissibility of the organism.¹³ Our experience supports this, and we recommend that children use topical treatments as well as oral drugs.^{15 16} It is not clear at what stage during treatment a child is free from spores. However, current advice states that once children are receiving adequate treatment (oral and topical) it is safe for them to return to school.¹⁶

Conclusion

Scalp ringworm seems to be increasing in the United Kingdom and is reaching epidemic proportions in some areas. *T tonsurans* is responsible for most of these cases. Doctors should consider scalp ringworm in any child with a scaly scalp in whom a diagnosis of dandruff or scalp eczema has been suspected.¹⁶

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Lesson of the week**Interfering antibodies affecting immunoassays in woman with pet rabbits**

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Many antibodies used in diagnostic immunoassays are derived from rabbits. Keeping rabbits as pets is known to be a risk factor for developing heterophilic (or interfering) antibodies.¹ Studies have shown that 30-40% of the population have heterophilic antibodies.² However, only about 0.05-0.5% of immunoassays seem to be affected to the extent that the concentration of interfering antibodies overwhelms the assay system.² We report a case in which the presence of heterophilic antibodies led to unnecessary investigations.

Case history

A 52 year old woman was referred to our hospital in July 2001 for further investigation of persistently raised fasting gut hormones concentrations. She had had irritable bowel syndrome diagnosed 16 years previously. The high concentrations of gut hormones had first been detected nine years ago, when, after an exacerbation of her condition, she had investigations to screen for other possible causes of diarrhoea. Computed tomography of



People who keep rabbits may develop heterophilic antibodies

Interfering antibodies must be considered when the clinical picture and immunoassay results do not match

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the abdomen, magnetic resonance imaging of the pancreas, and an octreotide scan at that time all gave normal results. The referring hospital attributed the abnormal blood test results to hyperplasia of pancreatic islet cells.

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Patient's fasting gut hormone concentrations (pmol/l), 1993-2001

Hormone (reference value)	January 1993	April 1995	April 1996	April 1997	April 1998	June 1999	March 2000	July 2001
Vasoactive intestinal polypeptide (<30)	279	30	7	<4	86	35	38	120
Pancreatic polypeptide (<300)	>500	>500	116	300	>500	>500	400	72
Gastrin (<30)	>400	>400	>400	>400	>400	>400	>400	125
Glucagon (<50)	>500	93	59	44	56	27	34	63
Somatostatin (<150)	71	284	247	92	156	93	138	103
Neurotensin (<100)	>1000	>1000	>1000	752	>1000	718	248	101

The patient was monitored with two yearly magnetic resonance imaging and annual measurement of fasting gut hormone concentrations. The results of imaging were always normal apart from a suggestion of hyperplasia of the islet cells, but her gut hormone concentrations remained persistently high. She was receiving no drugs apart from an oestrogen implant. She was managed conservatively as her condition remained stable.

On referral to our hospital, the patient's fasting gut hormone concentrations were still high (see table). Imaging of the abdomen and octreotide scanning gave normal results. We therefore booked the patient for pancreatic angiography with calcium stimulation to ascertain whether she had abnormal functioning islet cells.³

It is unusual for a neuroendocrine tumour to secrete more than one hormone, so we considered whether the patient could have heterophilic (interfering) antibodies. The radioimmunoassays for fasting gut hormones all use rabbit antibodies. On further questioning, it transpired that she and her husband had kept large numbers of pet rabbits (up to 80 at one time) and that she had presumed rabbit induced allergic rhinitis. Her husband was an officer of the British Rabbit Council.

The presence of heterophilic antibodies in the patient's serum was confirmed by the addition of small concentrations of non-immune rabbit serum to the gastrin assay buffer. This blocks the interfering antibodies without otherwise affecting the assay. The patient's results for gastrin were 95 pmol/l (no rabbit serum added), <20 pmol/l (0.5% rabbit serum added), and <20 pmol/l (1% rabbit serum added). The reference range for gastrin is <30 pmol/l. We cancelled the angiography, reassured the patient, and discharged her back to the referring hospital with the diagnosis of presumed irritable bowel syndrome with heterophilic (rabbit) antibodies interfering with the gut hormone assay.

Discussion

It is likely that our patient's exposure to her pet rabbits led to the development of the heterophilic antibodies. The consequence of this in her case has been needless investigations and clinic appointments, although, fortuitously, no major clinical intervention. Earlier communication may have led to the interference being detected sooner.

Heterophilic antibodies are common in the population and cause interference in up to 0.5% of immunoassays.^{1,2} Interference from heterophilic antibodies should be considered whenever immunoassay results do not correspond with the clinical and diagnostic pictures, and it is important to recognise that multiple immunoassays can be affected. Failure to take account of heterophilic antibodies can result in unnecessary investigations and clinical interventions. It is therefore essential that physicians and the laboratory interact closely. Increased use of assays with heterophilic antibody protection would also help avoid the problem.

Contributors: AP saw the patient in clinic, investigated the patient for interfering antibodies, performed some of the assays, and wrote the case report; ME had the original idea of the involvement of interfering antibodies and reviewed the case report; MD and MG took part in the assays and reviewed the case report. Susan Williams helped with the assays and Richard Chapman advised on detecting heterophilic antibodies. KM is the consultant in charge of the patient, reviewed the case report, and is the guarantor.

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One hundred years ago

Canada and the cigarette question

The Canadian House of Commons has passed a measure forbidding the importation, manufacture, and sale of cigarettes in the Dominion of Canada. The Bill met with violent opposition, but was finally passed. This is the most drastic measure on the subject that we have yet heard of. The Bill which the British Antitobacco and Antinarcotic League wishes to have introduced into our own House of Commons provides only for the suppression of the juvenile smoker, and the various States of

the American Union which have legislated against cigarettes all leave the adult to use his discretion in the matter. But the Canadian measure appears to be aimed at cigarette smoking without limit of age. It will be interesting to see whether the Dominion will be more successful in putting down cigarettes than Sir Peter Laurie was in the determination which he expressed to put down suicide.

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