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Investigation of diarrhoea in a traveller just returned from India

Abstract

The causes of diarrhoea in people returning from travelling can be infective and non-infective, and the duration of symptoms is an important factor in identifying the cause. The article outlines the appropriate investigations

Keywords

india, traveller, just, returned, investigation, diarrhoea

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PRACTICE

RATIONAL TESTING

Investigation of diarrhoea in a traveller just returned from India

The causes of diarrhoea in people returning from travelling can be infective and non-infective, and the duration of symptoms is an important factor in identifying the cause. The article outlines the appropriate investigations

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This series of occasional articles provides an update on the best use of key diagnostic tests in the initial investigation of common or important clinical presentations. The series advisers are Steve Atkin, professor, head of department of academic endocrinology, diabetes, and metabolism, Hull York Medical School; and Eric Kilpatrick, honorary professor, department of clinical biochemistry, Hull Royal Infirmary, Hull York Medical School. To suggest a topic for this series, please email us at practice@bmj.com.

A previously well 21 year old student who has just returned from a three week trip to India presents with diarrhoea. In her final week there she did volunteer work in a rural village. Her symptoms started five days ago, with three to four unformed motions a day, fever, and cramps. Her fever has resolved but loose motions continue. A physical examination is normal except for active bowel sounds.

What is the next investigation?

Definitions differ slightly, but classic travellers' diarrhoea is usually defined as three or more unformed stools within 24 hours passed by a traveller and accompanied by other symptoms—most often cramps, nausea, fever, blood with the stools, vomiting, and faecal urgency. More than 15 million travellers are estimated to experience diarrhoea each year¹; developing countries in particular are high risk destinations, with rates of diarrhoea between 20% and 90% for each two week stay, usually in the first week of travel. Travellers' diarrhoea often disrupts planned activities.¹

Though travellers are often told to "boil it, cook it, peel it, or forget it," the effectiveness of personal hygiene and dietary precautions in preventing travellers' diarrhoea has been questioned, with a review reporting that seven of eight studies found no evidence that these personal hygiene precautions prevented or reduced the risk of developing travellers' diarrhoea.² The single prospective study on the ability of

travellers to follow strict hygiene advice found that by three days into their trip 98% of Swiss travellers who responded had been unable to follow such advice.³

The causes of diarrhoea in travellers can be both infective and non-infective. The duration of symptoms is an important factor in thinking about the likely cause. About 50-75% of acute cases of travellers' diarrhoea (duration less than two weeks) are caused by bacteria.⁴ The most common bacterial cause is enterotoxigenic *Escherichia coli*. Other common bacterial causes include campylobacter, salmonella, and shigella. Viruses, most commonly rotaviruses and noroviruses, account for 10-20% of cases, and parasitic agents such as giardia, cryptosporidium, and cyclospora account for up to 5% of cases.⁴ *Vibrio cholerae* is an uncommon cause of acute travellers' diarrhoea but is worth considering if the patient has travelled in the area of an outbreak. Even with careful laboratory investigation, however, no pathogen is detected in a substantial proportion of cases. Diarrhoea can also be a presenting feature of sepsis from a range of causes including pneumonia and urinary tract infection, as well as other travel related infections including typhoid fever (though this more often causes constipation). If the traveller is febrile and has been to a malarial area, consider the risk of malaria.⁵

When diarrhoea has been present for more than two weeks, the spectrum of possible causes is wider and non infective causes become increasingly important. Taking a good travel and clinical history is paramount. Features of the stool may be of help. Blood and mucus is characteristic of dysentery, which can be caused by a range of pathogens including shigella and amoeba. Bulky stools suggest giardia or malabsorption. However, stool microscopy and culture is the key investigation.

The triple faeces test (collection of faeces specimens on three consecutive days) has been shown to increase substantially the

Learning points

The likely cause of travellers' diarrhoea depends on the duration of symptoms

Bacteria, in particular enterotoxigenic *Escherichia coli*, are the most common pathogens found in travellers with acute symptoms (less than two weeks' duration)

Stool microscopy for ova, cysts, and parasites and culture (ideally three specimens) form the key investigation in a patient who has just returned from travelling and has diarrhoea, although a causative agent is often not found

If symptoms persist, investigate for less common pathogens, such as parasites, and for non-infective causes

diagnostic yield of parasites^{6 7} but is often not practical. The stool should be examined for ova cysts and parasites and be cultured for bacteria, with viral antigen detection tests conducted. Stool specimens are not easy to collect in general practice. Patients can collect a specimen by putting plastic film over the toilet bowl under the seat, then scooping some stool into the sample jar. The stool sample needs to get to the laboratory immediately to have the best chance of pathogens being identified. The specimen should be refrigerated only if a delay of more than six hours is likely. Most laboratories have a "stool collection kit," which includes patient instructions and one plain plastic container and one container with fixative (for parasite identification). Other tests (table 1) can be done on the sample in the plain container. Communication with the laboratory may be needed to ensure appropriate samples are collected, and it is important to provide the pathologist with relevant clinical information.

Systemic infections may present with diarrhoea and may need to be excluded in a traveller returning from a foreign place. Other investigations will be influenced by the history and clinical circumstances (table 2).

Outcome

Rehydration is the main aspect of treatment. Antimotility agents are often self administered but are best avoided if there is fever and bloody diarrhoea as they may prolong the illness.⁴ Antimicrobials are often of limited benefit in reducing the mean number of stools a day but may shorten the duration of the illness in the acute phase.^{9 10} Limiting use to cases in which symptoms are moderate (more than two stools per 24 hours and distressing symptoms) to severe (fever or bloody stools, more than six stools in 24 hours) is recommended.¹¹ Resistance to antibiotics has been increasing and is common to doxycycline and co-trimoxazole (a mixture of trimethoprim and sulfamethoxazole).⁹ Quinolones are most commonly used for empirical treatment in non-pregnant adults, but azithromycin may be preferred for treating travellers to South East Asia and India owing to rising rates of resistance to quinolones in campylobacter species.¹¹

In the case above, the stool microscopy and culture did not identify any causative agent. Her symptoms improved over several days, but a month later she described irregular bowel habit and abdominal bloating. Once symptoms become chronic (lasting more than two weeks) or relapsing, non-infective problems need to be considered. Table 3 gives a list of the most common causes.

Tests of the stool for reducing substances were normal. Further stool examinations including antigen tests for ova, cysts, and parasites were negative. Serological tests on blood for antibodies against *Entamoeba histolytica*, *Strongyloides stercoralis*, and

schistosoma were negative. A coeliac screen with anti-gliadin antibodies and transglutaminase antibody IgA was negative. A diet low in lactose made no noticeable difference to symptoms, and the likely cause of the continued symptoms was thought to be irritable bowel syndrome.

In a prospective cohort study of 97 students travelling to Mexico, 10% of those who had travellers' diarrhoea subsequently developed symptoms of irritable bowel syndrome.¹² Other research has found that 12 months after an episode of acute gastroenteritis (not necessarily associated with travel), between 4% and 31% of people have post-infectious irritable bowel syndrome.¹³ General advice includes reduction of caffeine intake and increased dietary fibre. In this patient the symptoms resolved after 12 months.

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Tables

Table 1| Stool investigations in travellers' diarrhoea

Investigation	Comments
Stool microscopy for ova, cysts, and parasites	Sensitivity varies depending on the parasite but generally exceeds 80% Sensitivity is increased by examining several samples ²
Stool culture and viral antigen testing	Bacterial or viral cause can be identified in 50-70% of travellers who have diarrhoea lasting <2 weeks ⁴
Test stool for <i>Clostridium difficile</i> toxin	If antibiotics have been used in the past month
Test stool for disaccharides (reducing substances)	If the patient has clinical features of malabsorption or persisting diarrhoea. If so, a test of stool acidity can be used to identify lactase or sucrase deficiency

Table 2| Basic investigations other than stool microscopy and culture

Investigation	Comments
Full blood count, blood film, and differential	Useful in investigating for systemic infections and may prompt further specific investigations. For example, white cell count may be low in overwhelming sepsis and malaria. Eosinophilia suggests parasitic infection. Thrombocytopenia is present in 40-85% of patients with malaria ⁸
C reactive protein and erythrocyte sedimentation rate	Raised in systemic infections
Serum electrolyte concentrations and renal function tests	Important if dehydration is suspected
Liver function tests	Raised transaminase and bilirubin levels may indicate hepatitis, amoebiasis, or septicaemia
Blood films for malaria parasites or immunochromatography test	Diarrhoea is present in about 20% of people with malaria. Malaria is not excluded on a single film, and examination of three blood films is recommended if malaria is suspected

Table 3| Non-infective causes of diarrhoea

Non-infective causes	Characteristics
Post-infective malabsorption	Tends to get better over weeks, especially with elimination of exacerbating foods such as dairy products
Irritable bowel syndrome	Patient will have a suggestive clinical history and usually chronic symptoms; the syndrome is often a diagnosis of exclusion
Lactose intolerance	Symptoms are exacerbated by intake of dairy products; investigations may show disaccharides in stool and a positive hydrogen breath test
Tropical sprue	Patient will have a history consistent with this diagnosis, such as steatorrhoea, cramps, and weight loss; suggestive features on bowel biopsy
Inflammatory bowel disease	Usually diagnosed on bowel biopsy
Coeliac disease	Patient will usually have history of symptoms predating travel and may have a family history. Arrange confirmatory blood tests (anti-gliadin and anti-transglutaminase antibodies) and biopsy after gluten challenge
Malignancy	More likely in older patients and those with ongoing symptoms and when diarrhoea is accompanied by rectal bleeding and weight loss
Hyperthyroidism	Abnormalities on thyroid function tests (the patient may also have other symptoms of hyperthyroidism)