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Traveller's diarrhoea

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Key words

Travel medicine, traveller's diarrhoea, tourism

Abstract

Every year more than 30 million people from developed countries travel to less developed countries for business, pleasure or adventure. Numerous studies have shown that even on trips of short duration, up to 50% of these travellers will experience some form of illness whilst abroad, or on their return home. Many of these travellers will present to physicians on their return home, hence an understanding of common travel health problems is an essential aspect of many fields of medicine, particularly general practice, infectious diseases and emergency medicine. The most common health problem to affect travellers is diarrhoea. Traveller's diarrhoea is predominantly bacterial in origin and causes significant morbidity. Despite a variety of preventative measures that can be put in place, most travellers are non-compliant with these. However, this type of advice may not necessarily provide protection anyway. An aggressive approach to treatment utilising antibiotics is commonly recommended both in adults and children. Maintenance of hydration is also important.

Introduction

"Health is infinite and expansive in mode and reaches out to be filled with the fullness of the world, whereas disease is finite and reductive in mode and endeavors to reduce the world to itself."

Oliver Sacks

Each year, more than 30 million people from industrialized countries travel to a developing country for business or leisure.¹ On doing so, they potentially expose themselves to sudden changes in climate, altitude, microbial flora and traffic conditions. These factors, combined with stress and fatigue may easily result in illness or injury whilst abroad. In fact, numerous studies have shown that the rate of illness in travellers varies from 36–75%.²⁻⁴ The key factors determining the health risks to which a traveller will be exposed, include the destination, duration, accommodation, standards of food hygiene in the destination, and the individual traveller's risk-taking behaviour.⁵

In all epidemiological studies of travellers' health problems, gastrointestinal disorders are the most common complaint; primarily traveller's diarrhoea (TD). One can compare data collected from long-term Peace Corp workers,³ leisure travellers,¹ Royal Geographic Society expedition members,⁶ and members of a Mount Everest mountaineering expedition,⁷ and find that gastrointestinal complaints dominate in all groups (Figures 1 and 2).

Interestingly, respiratory problems are consistently the second most common problem in travellers and account for around 25% of complaints in all groups. There is, however, a significant difference in the less common complaints when one compares the groups. As one might

expect, the Everest mountaineers have a much higher rate of environmental problems such as altitude sickness.⁷ Royal Geographic Society expeditioners had the highest rate of accidents⁶ and long-term Peace Corp workers had significantly more skin and psychological problems than other groups.³ This paper will focus on the most common of traveller's complaints – traveller's diarrhoea.

Epidemiology

Diarrhoea is the most common health problem faced by travellers. Depending on the destination, up to 50% of travellers can expect to have an episode of TD on a two-week trip. TD is currently defined as more than four loose stools in 24 hours, or more than three loose stools in 24 hours plus at least one of the following complaints: nausea, vomiting, abdominal cramps, fever, faecal urgency, abdominal pain, tenesmus, bloody or mucous stools.⁸ Three general geographic zones of risk have been identified. Low risk areas (<10%) include Australasia, North America, Central and North Europe, and Japan. Intermediate risk areas (15–20%) include Russia, the Caribbean, Israel, Eastern and Southern Europe, South Africa and China, whilst high-risk areas (20–50%) include the developing countries of Africa, South and Central America and Asia.⁹ In very high-risk areas this risk persists for a prolonged period. A study of long term expatriates in Nepal demonstrated a 50% per month risk of an episode of diarrhoea that persisted for at least the first two years of their stay.¹⁰

Whilst TD is often considered a trivial illness by doctors in developed countries, it can in fact be debilitating and usually occurs in unfamiliar surroundings and often with limited access to reliable medical care. Nearly 40% of those who

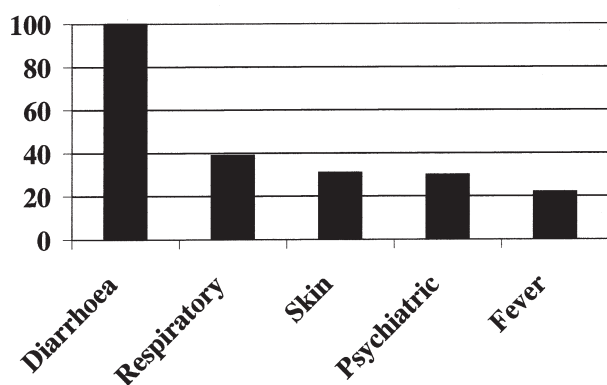


FIGURE 1
HEALTH EVENTS PER 100 PEACE CORP VOLUNTEERS PER YEAR

develop TD are forced to modify their activities (often at great expense), at least 20% are confined to bed for a day or more, and 1% are hospitalized.⁹

Greg Child, one of the world's top mountaineers, describes his experience of TD in Pakistan thus:

“The next phase of the expedition is ambitious – climb Rakaposhi, a huge mountain reaching into sky and cloud. But ambition has left, replaced by unshakeable illness in us all. A combination of dehydration and dysentery flattens me, and I end up back in Karambad, in hospital for the day, and I'm prostrate for a week. It was a small thing that entered our gut, bacterial in dimension, but devastating out of all proportion to its size.”¹¹

Apart from the obvious discomfort of an episode of TD, complications can occur such as chronic diarrhoea (in 3% of individuals), Reiters syndrome, problems resulting from the impaired absorption of regular medications and there is the risk of dehydration in susceptible individuals such as children, the elderly, the pregnant, and diabetics.

Prevention

Prevention of TD has traditionally centered on patient education and avoidance of 'risky food and water'. In general, contaminated food is more commonly a cause for diarrhoea than contaminated water. However, there are numerous pathogens that may be spread by contaminated water, so travellers should still be advised to avoid untreated water. Boiling is the most effective method of making contaminated water safe to drink. It needs only be brought to the boil, even at altitude.¹² Halogens such as iodine and chlorine are useful against all but the parasites Cyclospora and Cryptosporidium – travellers to areas with these pathogens (eg. Nepal from May – September) should be aware that using halogens alone will provide inadequate protection. Bottled water may not be reliable – carbonated

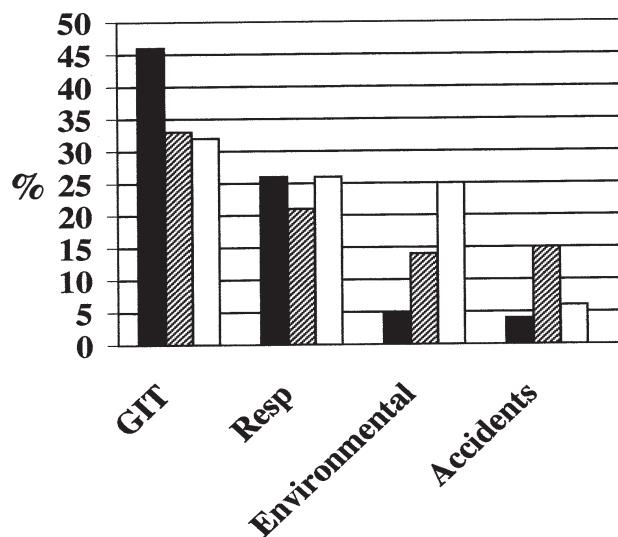


FIGURE 2
HEALTH EVENTS IN THREE TRAVEL GROUPS
USA Tourists - black
Royal Geographic Society Expedition - hatched
Mount Everest Climbers - open
(GIT - gastrointestinal tract; Resp - respiratory)

drinks are safer and the seal should be checked on any bottled drink.

Travellers are always advised to avoid salads, uncooked food or unpeeled fruit. This is best summarised as, “Cook it, peel it, boil it or forget it”.¹³ Does this advice work and are travellers compliant? A Swiss study of short-term travellers to moderate- and high-risk destinations showed that only 2% of people adhered consistently to these recommendations. Within three days of arrival in their destination, 53% had consumed ice in their drinks and 73% had eaten salads or raw vegetables.¹³ Clearly, compliance is a problem, however following the recommendations may not necessarily provide protection anyway.

A study on diarrhoea in long-term expatriates in Nepal, a highly endemic environment, showed that eating out in restaurants was the dominant risk factor for developing diarrhoea, independent of the type of food consumed.¹⁰ The authors state,

“This study suggests that travellers should be informed about the ubiquitous exposure to pathogens and the fact that the dominant risk factors for diarrhoea are difficult to modify (younger age, duration of stay, seasonality, and eating meals in restaurants).”¹⁰

This would not suggest that it is wise to eat with impunity overseas, but to be aware that despite one's best efforts, illness may occur. There are some foods known to be of particular risk, shellfish being the most important of these.

Aetiology

The dominant aetiology of TD is bacterial, with enterotoxigenic *Escherichia coli* (ETEC) being the dominant pathogen in most studies. Table 1 shows accumulated aetiology data from a number of studies.¹⁴⁻¹⁶ The aetiology does vary significantly, however, from country to country. For example, data being collected currently in a travel medicine centre in Nepal, shows the dominant pathogen is *Campylobacter*, with ETEC following closely behind (Pandey P, Cave W, The CIWEC Clinic Kathmandu, personal communication). Because of this dominant bacterial aetiology, in the absence of good medical and diagnostic facilities, travellers are advised to self-treat using algorithms and medical kits prepared at home.¹⁷

Children with TD

Children appear to be even more susceptible to TD than adults. The approach to TD in children has traditionally been the same as if they were not travelling. However, attitudes to management are now changing. Although there are only limited data on TD in children, one Swiss study showed that children between the ages of three months and three years had a high incidence of diarrhoea and tended to have both severe and prolonged disease. In children of this age group, TD persisted for a median of 18 days and an average of 30 days.¹⁸

It may be difficult to establish whether a child has diarrhoea. In 1985, the National Institute of Health Consensus Report defined TD in children as characterised by a twofold or greater increase in frequency of unformed stools.¹⁹ Increasingly, it is being recommended that if children have TD that fits the current criteria that they should be treated, like adults, with antibiotics (see below).

TABLE 1
RATES OF PATHOGENS ISOLATED IN
TRAVELLER'S DIARRHOEA

(The rates for *Cyclospora*, *Cryptosporidium* and viral infections are unknown)

Pathogen	Average rate (%)	Range
ETEC*	50	30–75
EAEC**	15	5–30
<i>Shigella</i>	10	0–30
<i>Campylobacter</i>	<5	0–15
<i>Salmonella</i>	<5	0–10
<i>Giardia</i>	<5	0–10
<i>E. histolytica</i>	<3	0–5
None	20	10–40

* Enterotoxigenic *E. coli*

** Enteroadherent *E. coli*

Treatment

TD is usually a self-limiting condition, but because it often occurs in areas with unfamiliar or inadequate medical facilities it is potentially very disruptive. For this reason, travellers are advised regarding empiric treatment if no reputable facility is available. Management of traveller's diarrhoea comprises hydration, symptomatic relief and definitive treatment. In all cases, travellers are advised to use a rehydration solution such as Gastrolyte to avoid dehydration and the problem of requiring intravenous fluids in a potentially unsterile medical environment.

If the TD is mild, ie. fewer than three motions in 24 hours and without other symptoms, either rehydration alone, or the addition of Loperamide if the diarrhoea is inconvenient, are recommended. If the criteria for TD are met, initial treatment is with a fluoroquinolone such as Norfloxacin (400 mg BD for three days) or Ciprofloxacin (500 mg BD for three days).^{19,20} If this treatment does not resolve the problem, the traveller should seek medical advice to exclude a fluoroquinolone-resistant bacterial diarrhoea or parasitic cause for their symptoms.

Azithromycin, at a dose of 500 mg daily for three days is the drug of choice for fluoroquinolone-resistant *Campylobacter*.²⁰ Unfortunately, it can be difficult to find medical facilities abroad with adequate laboratory support to provide this information. For high-risk destinations and activities such as trekking in the Himalaya, Tinidazole may be trialed for presumed *Giardia* infection.

In children, the drugs of choice are also Ciprofloxacin and Azithromycin. In Australia and New Zealand, Ciprofloxacin is not generally used in children. However, in many countries it is used in prolonged courses for children with chronic conditions such as cystic fibrosis with no apparent adverse effects.²¹ Azithromycin is an excellent alternative, which has been shown to be particularly effective against fluoroquinolone-resistant *Campylobacter* and *Shigella spp.*^{20,22,23} However, it is not available in paediatric formulations in Australia or New Zealand.

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Medical kits for travellers

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Key words

Medical kits, travel medicine, tourism

Abstract

As health problems are so common in travellers, and reliable medical facilities are often unavailable in less developed countries, travel medicine specialists advocate the use of personal medical kits. These kits are designed to allow the traveller to self-treat common minor conditions when they are in the not uncommon situation of having no access to reliable medical care. Another concern in less developed countries is the proliferation of fake or substandard medications.

Millions of people each year leave their homes to travel, many of them to less developed areas of the world. Multiple studies have shown an illness rate of 50% for travellers on a short trip to less developed countries. It is clear that with such a high rate of illness abroad, traveller's medical kits are an important aspect of pre-travel preparation. In many less developed countries it is difficult, if not impossible, to

access reliable medical care. This is particularly true if one is in a remote location undertaking adventure activities such as trekking, rafting, diving, etc.

Additionally, there is a thriving trade in both fake and substandard medications in many parts of the developing world. The World Health Organization estimates that 15%