Travel, especially to areas where one may contract the seemingly ubiquitous "traveler's diarrhea" can make one anxious about appropriate preparation techniques. Preventive techniques are foremost on the lists of travelers. These treatments commonly include standard antibiotics taken preemptively or upon symptom appearance. In general, quinolone antibiotics and antidiarrheal agents (loperamide) are the main tools of pharmaceutical prevention. While these techniques can be effective, and even required among certain high-risk groups, their side effects leave some of those who travel looking for alternatives.

Traveler's diarrhea is the most common illness reported by people who venture out of country; it can affect up to 50% of people. Traveler's diarrhea is technically defined as three or more watery, unformed stools in 24 hours, accompanied by at least one of the following symptoms: fever, abdominal cramps, nausea, vomiting, or bloody stools. Mild traveler's diarrhea may appear with fewer than three watery unformed stools; it may appear as one isolated incident of diarrhea with abdominal cramps. The majority of cases occur in the first two weeks of travel and will last roughly four days without treatment. Traveler's diarrhea is typically not life-threatening, but may cause severe problems in higher risk groups such as infants, the elderly, the immune-compromised, and others with chronic disease conditions.

Travel destinations that provide the highest risk for developing traveler's diarrhea include Africa, South Asia, the Middle East, and Latin America. Another specific risk factor for traveler's diarrhea occurs with those taking medications that lower gastric acidity (Histamine H$_2$ blockers and proton pump inhibitors) since stomach acid is a major defensive barrier against pathogenic organisms.

Traveler's diarrhea is typically caused by food and water that has been contaminated with fecal matter in which the pathogens are found. Typically food types include tap water, unpasteurized dairy products, raw/undercooked animal products, salads, and unpeeled fruits. These food types are typically obtained in restaurants and from street vendors.

The most-oft indicated culprit in traveler's diarrhea is enterotoxigenic _E. coli_; other popular agents include Salmonella species, Shigella species, Campylobacter, and non-cholera Vibrios. Beyond these infectious agents, other potentially more virulent illness-causing "bugs" lead to conditions other than traveler's diarrhea. Prevention of illness by altering eating and drinking habits is the main vehicle of avoidance, however, these strategies are at times cumbersome and, even while fully endorsed, not 100% effective. Prophylactic antibiotic treatment is similarly effective, but will no doubt propagate drug resistance, and thus, widespread use is discouraged. Regular dosing with antibiotics for travelers diarrhea is also controversial in that most travel conditions prevent positive identification of the causative agent and, consequently, appropriate prescribing, leading to ineffective treatment and a revisiting of the topic of drug resistance.

Protection against gastrointestinal illness while traveling to Third World or other regions of endemicity can provide the traveler with increased odds against getting ill. In treating those illnesses that require the use of antibiotics, these same strategies are effective at decreasing and shortening the side effects directly related to antibiotic therapies. Use of natural medicines can also bolster one's defenses against these infections, perhaps decreasing the intensity of the infection or outright preventing the illness first-hand.

Probiotics

First and foremost in any discussion of gastrointestinal health are probiotics. While research of these organisms and several health aspects (Crohn's disease, irritable bowel, celiac, asthma, allergies, and eczema, to name a few) has burgeoned in the last decade, much is yet to be learned about them. Research into the use of probiotics is challenging, and like all other clinical investigations, uncontrolled variables present a major challenge to determining outright efficacy of probiotics as a primary interventional and preventive treatment.

The healthy digestive tract, complete with its full complement of microflora (400+ species) may be considered the main overseer of the immune system and general health. Dysfunction or imbalance of the gastrointestinal flora is well-known for allowing for the development of flora-induced diseases (traveler's diarrhea, post-antibiotic overgrowth, and viral illnesses) or conditions caused by immune dysfunction (inflammatory bowel diseases). Leading factors of microflora imbalance include antibiotic use, diarrhea, and constipation.

The use of probiotics in these and other conditions brings the gastrointestinal (GI) flora back into balance, thereby influencing bowel function and immune system balance. Probiotics are used prior to and during travel. Likewise, they should be employed in the event of actual diarrheal illness. They may also be used concurrently with antibiotic treatment, as the illness occurs. Studies determining the efficacy of probiotic use during antibiotic dosing remain elusive. However, due to the nature of drug pharmacokinetics and dosing schedules, probiotic dosing should be applied at points distant in time to dosing of antibiotics, to lessen probiotic-antibiotic clashes.

Natural Medicines & Traveler's Diarrhea: A Look at Preventive Techniques

Naturopathic Perspectives
by Jason Barker, ND
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SPECIAL SECTION: TREATING MALARIA and PARASITE DISORDERS with NATURAL MEDICINE

Toilets

Man, Woman, Handicapped

Wyjscie - Exit

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Probiotics will colonize the GI tract and ideally prevent the pathogenic organisms encountered during travel from grabbing an infectious foothold. One group of existing studies show a protective effect of Lactobacillus species up to 47% against traveler's diarrhea, while a combination probiotic (Bifidobacterium bifidus, Lactobacillus acidophilus, and Streptococcus thermophilus) is thought to slightly decrease the incidence of traveler's diarrhea, specifically. Other studies of probiotics and diarrhea have been equivocal or have shown a slightly positive benefit. The theory and recent research regarding probiotics in GI disease will continue to espouse the incredible utility these organisms serve in human health.

Probiotics are extremely safe when used in this regard, given that all appropriate treatment measures are taken, especially in higher risk groups. Probiotics do not have a demonstrated negative interaction with other treatments, namely antibiotics. In fact, the biggest risk in using probiotics is ensuring product purity, stability, and content. As with all natural medicines, certain manufacturing processes may produce questionable purity. The reader is encouraged to identify reputable sources of probiotic formulations, of which many are available.

**Secretory IgA**

Secretory IgA (sIgA) is a key factor of gut immunology and barrier function. Also found in the saliva, tears, breast milk, and mucus, secretory IgA is designed to prevent the entry of unwanted foreign proteins into the body. In fact, it is one of the body's first defenses against infection that originates from bacteria, viruses, parasites, and fungi. Deficiency may be a common occurrence, which then allows one to become more susceptible to infection, and may also be a link between imbalanced gut immunity and systemic illness. Secretory IgA works by binding to foreign antigens (proteins) and preventing them from gaining entry across a mucosal barrier. While low levels may leave one susceptible to infection, higher levels are seen in those fighting chronic infections or those with hypersensitive immune function. When an antigen is not bound by sIgA, it is allowed to attach to the intestinal or other mucosal lining, leading to irritation, possible inappropriate immune responses, and a possibility of increased intestinal permeability as a side effect from inflammatory responses against the antigens.

This presents a twofold factor in regard to infectious diarrhea: First, when sIgA is below adequate levels, pathogens are allowed to go “unannounced” in the gut, increasing the possibility of infection. Secondly, lowered sIgA may predispose one to malabsorption and leaky gut. In this state of intestinal dysfunction, pathogenic organisms may in turn find this a hospitable environment.

One form of probiotic, *Saccharomyces boulardii*, is a type of non-infectious yeast widely used for diarrhea treatment. *S. Boulardi* has shown efficacy in treating several types of antibiotic-associated diarrhea, including that arising from *Clostridium difficile*, as well as traveler's diarrhea. One animal study hypothesizes that the anti-diarrheal effect of *S. boulardi* is attributable to its ability to stimulate secretory IgA secretion in the gut.

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Bolstering the Gut

In order for preventive techniques to be most effective, they must rest upon a solid foundation of health. Likewise, the gut is an area in need of much attention when it comes to strengthening against pathogenic invaders. Prior to an anticipated trip to an area where enteric pathogens are common, avoidance of common gut-damaging items include non-steroidal anti-inflammatory drugs (NSAIDS) and alcohol. Both markedly contribute to the downfall of the gut mucosa, in separate ways. Alcohol will damage the mucosa, and when damaged sufficiently, the gastrointestinal immune system is suppressed. Again, the possibility of leaky gut surfaces, and enhanced susceptibility to infections results. Not to be overlooked in this scenario is the now-decreased ability to properly digest and absorb nutrients from the gut, along with the resultant blow to the rest of the immune system and host defenses from insufficient nutrient delivery.

Similarly, NSAIDs are notoriously unhealthy for not only the gut mucosa, but the liver and kidneys as well. In the gut, NSAIDs will damage the stomach, esophagus, and the small and large intestines. They do this by interfering with the molecules that instigate repair in the mucosal tissue (prostaglandins). NSAIDs essentially keep the gut mucosa from repairing itself, which allows it to become weak and damaged. And areas within the body that are weak or in disrepair are more susceptible to infection and disease.

Glutamine

Glutamine is an essential part of nearly all gastrointestinal-associated illnesses. Glutamine is a primary fuel source for the enterocytes, or cells lining the entire digestive tract. A lack of glutamine in the diet will lead to atrophy of the intestinal villi (finger-like projections that aid in absorption), decreased secretion IgA, and even absorption of bacteria and other large proteins from the gut into the bloodstream. Glutamine is an integral component of enterocyte metabolism, structure, and function. Supplementation of glutamine in individuals with various types of gastrointestinal mucosal injury will benefit from the effects of glutamine; it can rapidly heal this tissue.

While glutamine has very specific GI-supporting effects, it has not been directly indicated for prevention or treatment of diarrhea. In fact, glutamine has been shown to have no known benefit on diarrhea symptoms, once provided at its onset. However, glutamine is meant to be incorporated into a diarrhea-prevention program as an agent that will increase GI health and fortification. While prospective studies have shown a preventive effect of glutamine against traveler’s diarrhea, it still makes sense to keep the gut well-fed with this substance to maintain gut integrity and overall health in the event of an infectious episode.

Berberine

The main berberine-containing herbs of Hydrastis canadensis (goldenseal), Coptis chinensis (gold thread), and Berberis aquifolium (Oregon grape) all contain substantial amounts of the alkaloid berberine. Other lesser-known species contain berberine as well. Berberine exhibits several effects, including anti-inflammatory and anti-arrhythmic properties. Chief among its activities are its antimicrobial effects. Berberine has demonstrated activity primarily against bacteria and fungi and less against mycobacterium and protozoans.

Among the more common pathogens involved in traveler’s diarrhea, berberine has antimicrobial activity against E. coli, Shigella boydii, Vibrio cholerae, Entamoeba histolytica, and even Giardia lamblia (which causes a much-prolonged version of traveler’s diarrhea, with other symptoms). Berberine is thought to inhibit a bacterial protein that allows it to adhere to host cell membranes.

Summary

Treatment and prevention of traveler’s diarrhea involves taking generalized avoidance measures regarding food and drink. Other common treatments not mentioned here are, of course, dehydration and antidiarrheal/absorbive agents, such as bentonite clay and charcoal, which are standard-issue treatments in cases of traveler’s diarrhea. Natural medicines have a role in perhaps treating and certainly assisting the body in avoiding infection. Removing GI-tract damaging factors such as NSAIDS and alcohol will go a long way in improving the overall health of the gut; food allergies are another important factor but not part of this piece. Pre-treatment with probiotics and probiotic strains that will increase secretory IgA will assist in colonizing the GI tract with populations of bacteria that may defend against non-native bacteria. Glutamine is an agent that will strengthen the cells of the GI tract, ideally maintaining a healthy tissue response to everyday occurrences and against any pathogens encountered in travel. Finally, berberis is an alkaloid extract, found in several species of herbs, that has activity against some of the more common causative agents in traveler’s diarrhea. The combined use of all the above will ideally prevent the occurrence of diarrhea and, when diarrhea is experienced, may assist in more rapid recovery and/or less severe illness than diseases that are untreated or those that lead to more severe outcomes in high-risk populations.

Notes

20. TOWNSEND LETTER — JULY 2006