COULD THESE PARASITIC WORMS
BE GOOD FOR YOUR HEALTH?
Cate Montana investigates
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Some of the same intestinal parasites known to cause illness may be the secret to sorting gut problems.

Globally, intestinal parasitic infections affect about 3.5 billion people annually. Schistosomiasis, aka snail fever, caused by parasitic flatworms, kills 2 million people every year. And soil-transmitted helminth (STH) infections are chief among these illnesses, impacting more than a billion people and severely reducing life expectancy. Helminths are parasitic worms that can infect animals and humans.

On the flip side

As dangerous and debilitating as parasitic infections are, strangely, there is a slow-growing awareness among some members of the global health community that improved sanitation and in turn the decreased presence of nonpathogenic intestinal worms in humans may also have led to impaired immune function and increased levels of inflammation. They have contributed to epidemic levels of autoimmune diseases and allergies as well as metabolic disorders and even psychological issues.

“With all our food preparation devices, sanitation systems, water filtration systems and the wearing of shoes, we’re just not getting exposed to organisms we’ve developed a healthy symbiotic relationship with over the course of millions of years—organisms that stimulate the human immune system in ways that nothing else does,” says William Parker, PhD. A leading research expert in helminth therapy, Parker is the CEO of WPLab Inc. (wplaboratory.org) and visiting professor in the Department of Psychology and Neuroscience at the University of North Carolina Chapel Hill.

A plethora of autoimmune diseases

In the US, autoimmune diseases alone affect one in 10, more than 23 million people, 78 percent of whom are women. Autoimmune diseases include the following:

• Inflammatory bowel disease (IBD): the immune system attacks the intestinal lining
• Hashimoto’s thyroiditis: the immune system attacks the thyroid gland
• Multiple sclerosis (MS): the immune system attacks the myelin sheath around nerve cells, causing communication between the brain and the rest of the body to deteriorate
• Rheumatoid arthritis (RA): antibodies attack the lining of the joints
• Scleroderma: the immune system attacks skin cells, hardening the skin
• Type 1 diabetes: antibodies attack and destroy insulin-producing cells in the pancreas
• Vasculitis: the immune system damages blood vessels throughout the body

Though it’s the fifth leading cause of death in women under 65, the number and variety of autoimmune issues create puzzlement in mainstream scientific circles as to their cause. And why do they affect mostly women?

The most likely postulated candidate for the sex differentiation so far is hormones in general and estrogen in particular. Estrogen levels fluctuate far more in women through the different stages of life than in men—especially during and after pregnancy.²

But some researchers and physicians are not so puzzled. Parker, for example, believes that autoimmune diseases clearly have four main causative drivers: stress, vitamin D deficiency, genetic factors and the modern-day depletion of normal symbiotic critters inhabiting the intestinal tract.
“Basically, the problem is that a lot of things that stimulate the immune system, like helminths, do that in ways like nothing else. When you take that away, then suddenly your immune system just doesn’t do so well. Reintroducing helminths can restore natural function.”

On the other hand, some doctors take a totally different stance. One is Dr Linda Lancaster, ND, homeopathic physician and founder of Light Harmonics Institute (lightharmonics.com), an energy medicine clinic and educational center based in Santa Fe, New Mexico.

“I don’t believe in what is called ‘autoimmune diseases’ at all,” says Lancaster. “I think what people are dealing with is continuous allergic reactions due to being poisoned by heavy metals, chemicals, GMOs and EMF radiation. Stress is another factor.

“And on top of all that, being afflicted by microscopic parasites, worms, fungi, bacteria and viruses creates a toxic load that drives the body out of homeostasis [healthy balance]. Once all that is cleared up and a healthy lifestyle is achieved, the body has a chance to heal on its own. But deliberately introducing parasites that cause so much trouble in the first place? From my experience, that is not a good idea.”

This pretty much summarizes the two basic positions on what is now known as helminth or helminthic therapy—a protocol for a wide variety of autoimmune and metabolic issues that introduces one or more “domesticated” intestinal worms into the human system, including Trichuris suis ova (TSO), or pig whipworm eggs; Necator americanus (NA) hookworms; and Hymenolepis diminuta cysticerci (HDC), or rat tapeworm larvae. Trichuris trichiura ova (TTO), human whipworm eggs, although not commonly used, have also been experimented with successfully.

Completely unregulated and off the radar of global health organizations like the US Food and Drug Administration, helminth therapy is strictly a “self-treatment” approach (see below. Occasionally a doctor can be found who will monitor a patient’s health during their initial inoculations, but few will allow their names to be associated publicly with the process.

Varied hypotheses

The parasites’ positive effects are due to the substances they produce (see ‘How do helminths work?’), but beyond that knowledge, debate persists about why helminths work. Helminth therapy advocates tend to believe in one of several hypotheses.

The first is the hygiene hypothesis, which posits a link between more sanitary environmental living conditions and autoimmune/allergy issues. It was first established by findings from a study arguing that without helminthic parasites, people become predisposed to Crohn’s disease.

The second, known as the “old friends” hypothesis, holds that relatively nonpathogenic parasites like TSO, TTO, NA and HDC, as well as other microorganisms, have evolved inside human beings for thousands of years, leading to a positive symbiotic relationship between certain parasitic worms and the gut.

This stance, of course, supports the microbiome depletion hypothesis, which holds that due to “overnight” changes (evolutionarily speaking) in diet, sanitation, commercial agriculture and general lifestyle, humans developed an overall lack of natural organisms in the gut, triggering a whole host of heretofore unknown immune-related diseases.

“It’s far more than an anecdote,” says Jane Puckey, an RN from New Zealand who self-treats with helminths for her own health issues. “Population studies, clinical trials and a thousand recorded testimonials show that helminth therapy is actually reconstituting our natural biome. They’re a part of the human ecosystem, and we’re missing it.”

Are all intestinal worms parasites?

The anti-helminth position that many physicians hold is supported by the blanket categorization of all intestinal worms as parasites that are harmful and debilitating to the host. And yet Parker, who has been doing research in this field for years, holds that the view of all worms as parasitic is “verifiably false.”

“Which are the good guys versus the ones that you don’t want to deal with? This is an important question,” he says. “If continued inoculation with a particular non-colonizing helminth [a worm that does not reproduce in the human body]
cures you of some deadly disease, prevents you from having debilitating allergies or airway hypersensitivity or autoimmune conditions, or cures you of a major depressive disorder, then it could not be classified as a parasite.”

Do even the “good guys” cause issues and side effects? Yes, they do. Stomach cramps, nausea and diarrhea are common symptoms during the early stages of helminth therapy. But Parker, Puckey and the thousands of people who are successfully practicing helminth therapy seem to consider these temporary side effects minimal and well worth it.

**Studies show efficacy**

A fast-growing number of studies show the beneficial effects of helminth therapy. Studies done on humans and animals reveal that non-colonizing helminths such as TSQ, TTO, NA and HDC inhibit inflammation in a wide variety of disease conditions, including the common autoimmune diseases IBS, MS, RA and type 1 diabetes.¹

Inoculation with TTO has been shown to effectively treat ulcerative colitis,⁵ and TSO can treat Crohn’s disease.⁶ Infection with NA effectively treats celiac disease.⁷ And helminth therapy has proven effective in treating asthma and atopy, a hypersensitivity to allergens including pollens and certain foods.⁸

As well, studies show helminth therapy is effective for treating neuropsychiatric disorders that can be driven by inflammatory conditions in the body.⁹ An observational study tracking 700 self-treating helminth therapy patients shows that helminth therapy relieves major depression and anxiety disorders, along with other inflammation-driven conditions.¹⁰

Recent studies have also confirmed the immunomodulatory presence of helminths can protect against the development of metabolic syndrome and type 2 diabetes,¹¹ and a meta-analysis review of studies shows that the presence of helminths is generally associated with improved metabolic function.

However, various parasite species show a “considerable” difference in effectiveness. The most positive metabolic impact appears to come from *Schistosoma mansoni*, a waterborne blood fluke.¹²

**Clinical issues**

The meta-analysis of a wide variety of helminths and their influence on metabolic issues points directly to a major difficulty that helminth therapy proponents face: identifying which parasite does what. Which exactly are the “good guys” and which are the “bad guys”?

It’s estimated that there are over 25,000 different types of nematodes (roundworms), many of which are difficult to differentiate. Although there are enormous similarities across the phylum Nematoda, each individual type of nematode has its own unique chemistry and biology.

And then there are the host’s chemistry and biology to consider. How will the two interact? How much is a case-by-case consideration?

Trichuriasis and ascariasis are two tropical diseases with a high death rate caused by the whipworm *Trichuris trichiura* and the roundworm *Ascaris lumbricoides* respectively.¹³ And yet *Trichuris trichiura*, a deadly parasite doctors have been fighting in the tropics with few positive results for decades, is the same nematode whose eggs, TTO, have been successfully used to treat ulcerative colitis in some patients.

Cases of infectious gastroenteritis are caused by numerous parasitic pathogens, including NA.¹⁴ And yet NA is one of the most successfully and commonly used worms in helminth therapy.

The difficulties in testing helminth therapy don’t stop there. Pharmaceutical research employs a standard 12-week trial period—a length that’s far too short for studies using live helminths. And helminth dosage requirements can vary from person to person by as much as a factor of 10.

These difficulties are why medical researchers are trying to identify and synthesize highly effective molecules mined from helminth waste products, which they hope can mimic the effects of helminth activity in the body. However, helminth-derived product therapy (HDPT) is most likely decades away from commercial production.
“The reductionist model just can’t work in this situation,” says Parker. “Helminths work in ways that nothing else does. Discovering that protein X or Y works by affecting this cell or that cell in a particular way completely bypasses any sense of energetic interplay that comes with a living, dynamic system.

“Helminth therapy is about people helping themselves to get better. That’s what this is all about.”

How do helminths work?

Scientific understanding of just how certain helminths benefit human health by helping to regulate immune function is truly in its infancy. But researchers are clear that it’s the excretory/secretory products (ESPs) that helminths produce as they feed that serve as immunomodulators in the human body.

NA (hookworms) inject ESPs into the gut tissue when they feed. Patients with hookworms show a reduced number of the T cells that regulate many aspects of autoimmune inflammation as well as fewer B cells, a type of white blood cell that can sustain inflammation. They also have higher levels of CD4+ T cells regulating tissue inflammation and of CD19+ B cells, which can downregulate inflammation.

One study analyzed ESPs from the pig whipworm *Trichuris suis* (TSO) and identified over 350 proteins. The researchers found the ESPs “markedly diminished” production of two pro-inflammatory cytokines while “strongly inducing” release of an anti-inflammatory one. As well, these proteins stimulate the production of interleukin-22, a cytokine involved in mucosal healing.

Types of parasites

The three main types of parasites affecting humans are ectoparasites, helminths and protozoans.

1. **Ectoparasites** live on the outside of the host in/on the hair and skin and usually feed on the blood of the host. Ticks, fleas and lice are examples of ectoparasites.

2. **Helminths** are worms that usually reside in the gastrointestinal tract. They propagate by laying eggs in the human body that are then excreted into the environment. Only in their adult stage do they grow large enough to be visible to the naked eye. Helminths fall into three categories:
   - Cestodes (tapeworms): flatworms that gather nutrients from the food we eat
   - Trematodes (flukes): a type of flatworm that travels in infected water and can live in the blood as well as in various organs, like the lungs, liver and intestines
   - Nematodes: roundworms that also live in the intestines, such as hookworms, which hook into the intestines to feed

3. **Protozoans** are microscopic, one-celled organisms that usually spread via contaminated water or food or via other humans or animals. They propagate via binary fission (meaning as adults they split in half!). Protozoans include these four categories:
   - Amoebas, which can change their shape by moving their pseudopods ("false feet")
   - Ciliates, which use hairlike cilia to move and eat
   - Flagellates, which use whip-like structures (flagella) to move
   - *Giardia intestinalis*, which causes diarrhea and cramps

Self-treatment

Although helminth therapy obviously has many clinically proven benefits, the lack of standardized, placebo-controlled trials means the therapy is not approved by health organizations. This means health and medical professionals can’t recommend, oversee or assist patients who want to self-treat.

That said, thousands of experienced “self-treaters” out there are willing to support and advise, and there is lots of online support at places like the Facebook Helminthic Therapy Support group (facebook.com/groups/htsupport).

And it can’t hurt to talk to your personal physician, who might agree to take an overseer role to ensure your overall health and well-being during the self-treatment process. But numerous medical professionals who are also self-treaters, like Jane Puckey in New Zealand, will counsel people about this therapy. She can be reached by emailing info@helminthictherapywiki.org.
John Scott's story

John's interest in helminthic therapy began back in 2007, when he was in his 30s, after lifelong gastrointestinal issues culminating in overwhelming food intolerances. John lives in Nottingham in the UK, and by the time he heard that nearby Nottingham University was recruiting subjects with Crohn's disease for a hookworm trial, he was surviving on the only food he could tolerate: a semi-elemental infant formula that was also starting to become problematic.

“I was diagnosed with allergies, food intolerances, myalgic encephalomyelitis (ME, symptoms of extreme fatigue and other issues), Crohn's disease, multiple chemical sensitivities and migraine,” says John.

“I told one consultant immunologist that I thought the problem was immunological, but he dismissed this suggestion and insisted that my symptoms were psychosomatic. So, when I saw that notice, I jumped at the chance to demonstrate that my issue was indeed immune-related.”

After an initial positive reaction to the hookworms, Scott was informed that he couldn’t be reinoculated and that the study wouldn’t be continued for some time, possibly a year or more. Desperate, he looked for another option—thus starting his self-treatment journey.

Not knowing any better, he started with 35 Necator americanus (NA)—far more hookworms than needed—an excessive dose that resulted in prolonged GI pain, nausea and diarrhea. But he also experienced steady symptomatic improvement.

He meticulously documented his journey for two years. Here a few entries from his journal that are posted on the helminth therapy wiki (helminthictherapywiki.org):

**Week four:** A day without any headache, extremely rare for me! And my nose was so clear that I found myself breathing through both nostrils at once, something I hadn’t done much since I was a child. Also, for the first time in many, many moons, I couldn’t wait to get up and greet the day.

**Week six:** I found myself suddenly taking an interest in cooking smells, my first experience of real hunger in years. I began to feel pleasurably better than I had for a very long time, with a new buoyancy and optimism. Eczema itching on my ears reduced.

**Week 26:** I had my first meal in 16 years. I also no longer need to go back to bed for a couple of hours in the middle of the day in order to prevent myself from sinking into extreme exhaustion. Also enjoying no headaches for periods of up to nine days in a row!

**Week 70:** There are only a few foods left that I can’t tolerate. My IgE-mediated allergies [immune system overreaction to certain foods] have all disappeared. My headaches are hugely reduced. My dodgy temperature control has completely normalized.

That was years ago. Today John has no colitis symptoms whatsoever. He re-inoculates with NA every five months and continues to self-treat and serve as an advocate for helminth therapy.

“Although the results have been truly spectacular, the remedy was, of course, not really a ‘remedy’ at all, in the normal sense of the word,” he says, “but simply a return to sharing life with a few symbiotic microorganisms that mankind has traveled with for many millions of years.”

Pete Dixon's story

Pete, who lives in Detroit, Michigan, was 36, doing bodybuilding and consuming a lot of protein powder when he started to have bad GI reactions. “I didn’t know what it was,” he says, “but it sort of went away and then came back, on and off, over the years. But nothing too serious. Then, when I was 42, I developed an abdominal abscess and had to have surgery.”

His GI problems continued after the surgery, and within two years he developed ulcerative colitis, a condition doctors told him they could do little about aside from prescribing medicated suppositories. Then one day at a friend's house, he ate a sandwich and had a terrible reaction, suffering projectile vomiting and diarrhea for over a day. “That’s when I figured out I had a bread/gluten intolerance,” he says.
Diagnosed with celiac disease, he grew progressively worse. Eventually he got down to being able to eat only a few foods—rice, fruit, potatoes, fish and eggs. "And even those things were still bad," he says. "I became housebound and ate at home and never went out and never ate at friends' houses."

At the point of asking his doctor to remove his colon, his memory flashed to an article he’d read about hookworm therapy years previous. “I definitely thought it was weird and awful taking parasites, but it was either lose my colon or try it. So, I ordered them.”

That was in July 2018. Within weeks his symptoms had cleared up and he was able to eat regular foods again. "But I was so scared about my celiac symptoms, I didn’t try gluten until December of that year. And when I did, I had no reaction at all. And don’t you know I was happy with that!"

**Helminth suppliers**

Companies that supply helminths for self-treatment include:

biomerestoration.com

tanawisa.com

symmbio.com

nalab.eu/en-us

**References**

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