

Travelers' diarrhea: Effective treatment

For the more than one million Americans who contract diarrhea each year while visiting developing countries, news emerged during the 1960s and 1970s that antibiotics are effective preventives against the condition. Now more good news for travelers is published in the Sept. 30 NEW ENGLAND JOURNAL OF MEDICINE by Herbert L. DuPont of the University of Texas Health Science Center in Houston and colleagues: Antibiotics are highly effective as a *treatment* for travelers' diarrhea.

The bacterium *Escherichia coli* is the major cause of travelers' diarrhea, the bacteria *Shigella* the second. Because the antibiotics trimethoprim (TMP) and sulfamethoxazole (SMX) are known to be effective against *E. coli* and *Shigella*, DuPont and his team wanted to learn whether TMP with or without SMX might be able to counter travelers' diarrhea. They conducted a double-blind study of 110 American adults attending summer classes in Mexico who succumbed to diarrhea during that time. Thirty-seven patients received 160 milligrams of TMP plus 800 mg of SMX twice daily for five days; 38 patients received 200 mg of TMP twice daily for five days; 35 patients got a placebo twice daily for five days.

By the end of the first day of treatment, subjects getting TMP plus SMX or TMP alone showed a significant reduction in diarrhea compared with patients getting a placebo. For days two through five of therapy, the differences were even greater for both drug treatment groups as compared with the placebo group. There was also a significant decrease in abdominal cramps by 24 hours in the TMP plus SMX group and by 48 hours in the TMP group as compared with patients getting a placebo. Relief from nausea also occurred more rapidly among patients in the drug groups than in the placebo group. TMP plus SMX or TMP alone were also found to be equally effective in shortening the duration of the condition, whether it was caused by *E. coli*, *Shigella* or some other pathogen. Finally, diarrhea persisted an average of 30 hours in patients getting TMP plus SMX or TMP alone, while it lasted an average of 93 hours in patients getting a placebo. "Early treatment with TMP/SMX or TMP is an alternative to prophylactic use of drugs for travelers' diarrhea," DuPont and his colleagues conclude.

David A. Sack of the Johns Hopkins Medical Institutions in Baltimore has also found, but not yet published, that antibiotics are a highly effective treatment for travelers' diarrhea. His treatment regimen is a three-day course of a single dose of the antibiotic doxycycline.

The option of using antibiotics as a treatment rather than a preventive against diarrhea holds two advantages for travelers, Sherwood L. Gorbach of the New Eng-

land Medical Center in Boston points out in an editorial accompanying the article by DuPont and his co-workers. One is that travelers are less likely to experience toxic side effects from antibiotics if they use them only after they come down with diarrhea, not before. The other is that if travelers use antibiotics only for treatment and not for prevention, they are

likely to use lesser amounts of antibiotics, and the lesser the amount used, the less opportunity bacteria have to build antibiotic resistance. Certain areas of the world are already burdened with a high incidence of antibiotic-resistant *E. coli*. Sack agrees: "One of the main advantages of the treatment approach as compared to prophylaxis would be that, at least hypothetically, you would . . . produce less antibiotic pressure on the environment."

—J.A. Treichel

Another twist in story of mass extinctions

On a recent cruise to the North Pacific, the drillship *Glomar Challenger* wrested from the seafloor the first three cores obtained in the Northern Hemisphere that completely span the boundary between the Cretaceous and Tertiary periods. The boundary layer of sediments, formed about 65 million years ago, is of intense interest to geologists because at the end of the Cretaceous, more than half of the kinds of life that flourished then suddenly disappeared. The newest cores are invaluable because the information they contain may help scientists better understand both the timing of the mass extinction and its cause. But preliminary analysis of the cores hints at new complications in an already twisted story. These cores show that some marine microorganisms thought to appear only with the beginning of the Tertiary period (after whatever event caused the extinctions) may have evolved before the Cretaceous forms died out.

The cores were drilled during Leg 86 of the Deep Sea Drilling Project. The Cretaceous-Tertiary boundary is defined by the presence of microfossils, including shells of tiny marine animals called foraminifera. Many species disappeared at the end of the Cretaceous; others appeared in the early Tertiary and quickly branched out to fill ecological gaps. In the cores taken on Leg 86 from the Shatsky Rise a Tertiary foraminiferan called *Globigerina eugubina* was found 40 centimeters below what is widely recognized as the boundary between the two periods.

"*Globigerina* doesn't usually occur until after the extinction of the Cretaceous forms," says Anthony D'Agostino of ARCO Explorations Co., in Houston. At sedimentation rates assumed for the end of the Cretaceous, the 40 cm built up in about 240,000 thousand years. This suggests that *Globigerina* may have evolved nearly a quarter of a million years before the Cretaceous species all were extinct. D'Agostino, who conducted some of the shipboard analyses, says he is almost certain that the presence of the later forms is not due to mixing of sediments.

Because *Globigerina* is one of the microfossils used in defining the beginning of the Tertiary, its appearance earlier than expected may send researchers back to other samples of the boundary for yet

another look. For instance, a section of limestone in Gubbio, Italy, is often referred to as a complete sample of the boundary and the two periods. However, the Leg 86 cores imply that the section at Gubbio is incomplete, D'Agostino says, because the two zones there do not overlap.

In the past few years scientists have been scanning the Cretaceous-Tertiary boundary for higher-than-normal levels of rare metals, including iridium. It has been suggested that the metals were deposited after an asteroid hit the earth. While scientists increasingly accept the idea that an impact did occur, it still is not clear precisely what relationship might have existed between such an event and the global extinctions at or near that time (SN: 6/2/79, p. 356; 1/12/80, p. 22; 10/14/81, p. 314).

Other cores that span the boundary were taken from seafloor near South Africa during Legs 73 and 74 of the DSDP (SN: 8/16/80, p. 104). Lloyd Burckle of Lamont-Doherty Geological Observatory and G. Ross Heath of Oregon State University in Corvallis were co-chief scientists on the recent cruise. Burckle says that cores taken during Leg 86 at another site also may have crossed the boundary, but that it is more difficult to tell because the sediments are composed of red clay, and lack the microfossils needed to identify periods. If iridium turns out to be a reliable marker for that boundary, it may be a useful tool in deciphering the earth history recorded in fossil-free sediments, Burckle says.

—C. Simon

Starch blockers banned

The starch blocker diet pill can no longer be sold, a federal district judge ruled this week. The reason: Starch blockers are drugs, not food as their manufacturers have contended, and have not been tested for safety and effectiveness and approved as a drug by the Food and Drug Administration.

The order followed hearings in which the FDA, blocker users and a Mayo Clinic physician testified that the blockers can cause vomiting, lethargy, confusion and other side effects, sometimes serious enough to require hospitalization. □