Proliferation of Pills

Antibiotics don't fight many infections well, yet doctors continue to prescribe them

By PAUL SMAGLIK

A 3-year-old child with a history of ear infections—and a history of taking antibiotics to treat them—received a diagnosis of sinus infection and a prescription for an antibiotic from his pediatrician. After the child's symptoms failed to improve, he returned to the doctor, who diagnosed an ear infection and prescribed a different antibiotic.

The boy's condition worsened, and he eventually wound up in the emergency room of an Atlanta hospital.

There, Benjamin Schwartz, an epidemiologist at the Centers for Disease Control and Prevention (CDC), ordered fluid drawn from the boy's ear. Examination of the fluid revealed that the boy was infected with a type of bacteria resistant to oral antibiotics. This diagnosis required that the boy return to the emergency room for several days to receive shots of a stronger antibiotic—a more painful and expensive remedy than oral antibiotics.

According to Schwartz, this cycle of repeated prescriptions may have increased the patient's risk of contracting the resistant bug. "Antibiotic use is the driving force for resistance. Antibiotics kill the susceptible organism but allow resistant strains to proliferate and spread to other [people]," the physician told an audience of clinicians and researchers in April at a conference sponsored by the National Foundation for Infectious Diseases in Washington, D.C.

Finding ways to combat antibiotic resistance—what Schwartz calls "the coming plague" of tougher bacteria—continues to challenge doctors. Old drugs are losing their effectiveness against hardier bugs, and new antibiotics under development are years from the market.

Complicating matters further, doctors have difficulty telling the difference between minor illnesses that don't require antibiotics and more severe conditions that do.

Indeed, a report in the March 8 LANCET suggests that antibiotics may not help most sinus infections—one of the conditions for which the 3-year-old boy received the drugs. In this study, F.L. van Buchem of St. Elisabeth Hospital in Tilburg, the Netherlands, and his colleagues took lung X rays of patients complaining of stuffed-up or runny noses and sinus headaches. Of the patients whose X rays showed polyps or swelling—signs of a sinus infection—108 received the antibiotic amoxicillin and 106 received a placebo.

The groups' symptoms were virtually indistinguishable after 1 week. After 2 weeks, 83 percent of the antibiotic group and 78 percent of the placebo group had recovered.

Van Buchem says that the patients' minor bacterial infections responded equally well to amoxicillin and to the placebo. His research points to a more limited use of the medicine in treating sinus infections. "Don't treat with an antibiotic until you know that it works, because we have so many problems when you get more antibiotic resistance."

Instead, van Buchem advocates a wait-and-see approach. Doctors should recommend analgesics, decongestants, and vaporizers for patients with minor sinus infections. If the symptoms don't improve after 2 or 3 weeks, the physician should take a closer look. Then, if he or she discovers a bacterial infection, the patient should receive antibiotics, recommends van Buchem.

"I think those conclusions are incorrect," says Jack M. Gwaltney Jr. of the University of Virginia Health Sciences Center in Charlottesville. Gwaltney disagrees with both van Buchem's results and his treatment recommendations.

Viral infections, which don't respond to antibiotics, cause some of the same diagnostic characteristics in X rays as bacterial infections, which do respond to antibiotics, Gwaltney says. The only way to distinguish between the two, he says, is to puncture the inside of an ear or nose with a needle, remove some cells, and grow them for several days in the laboratory—a procedure not recommended for widespread use.

Van Buchem counters that, in a preliminary study, he did punctures along with the X rays and found that results from the two techniques matched well. However, he designed the LANCET study to simulate conditions in a general practitioner's office. Such doctors may not have the skill to do punctures and don't want to wait several days for the results, he says. Moreover, he sees no reason to subject patients to the painful procedure, when in most cases it is unnecessary.

He acknowledges that some of the patients in his study may have had viral rather than bacterial infections. Nonetheless, he says, the results remain valid unless most of the patients had viral infections.

Gwaltney maintains that a physician should prescribe what he or she thinks is best, without making a patient wait and possibly suffer. "I'm not saying you should use them [antibiotics] indiscriminately," he says, acknowledging that such drugs have been overprescribed, leading to more resistant strains of bacteria.

Richard Lockey, an allergy and immunology specialist at the University of South Florida, Tampa, agrees with van Buchem's prescription but not his diagnosis. The problem, says Lockey, is that 75 percent of people with colds have abnormal chest X rays because a minor sinus infection accompanies most colds. Caused by viruses, colds don't respond to antibiotics, as a study similar to van Buchem's showed in the June 1, 1996 LANCET.

Most people with colds or minor bacterial infections in the sinuses get better on their own, so Lockey applauds van Buchem's emphasis on treating symptoms. For those who develop an additional, bacterial infection, physicians can prescribe antibiotics. Waiting 3 or 4 weeks after the onset of a cold or sinus infection before seeing a doctor makes sense, he says. Lockey adds that he would hesitate to use punctures as his main diagnostic tool. "It hurts like hell. It's not a nice procedure."

Doctors who closely question and observe their patients should be able to distinguish between sinus infections that do not require antibiotics and those that will respond to the drugs, says Lockey.

For example, patients with steadily draining sinuses may have a serious infection, while patients whose sinuses drain only in the morning may not.

"A specialist like myself would not put a person with a cold on antibiotics. A lot of general practitioners do that," Lockey adds.

Not all the blame for overprescription of antibiotics lies with doctors, however. Patients and a health care system that emphasizes treatment over education of patients share the responsibility.

"People expect to get antibiotics," Lockey says. "They've been programmed to expect it."

"[Some doctors] find it easier to write a prescription than to explain why antibiotics may be harmful," Schwartz says. Some fear their patients might seek other physicians if antibiotics aren't prescribed on demand. In truth, however, few people go "doctor shopping" in this situation, according to a recent study by the CDC, says Schwartz.

Doctors are beginning to realize that antibiotics are overprescribed. According to a 1996 CDC study of 30 physicians, respondents said that they could reduce antibiotic use 20 to 50 percent without harming patients. In another 1996 CDC survey, 98 percent of 350 Georgia doctors said that antibiotic overuse leads to resistance, and 80 percent said that patients could be harmed by taking antibiotics unnecessarily.

Schwartz says that about a third of all antibiotic prescriptions—about 50 million a year—are unnecessary. He adds that, despite growing recognition of the problem, he doesn't see a drastic change in practice yet.

Any skepticism regarding antibiotic use marks a change in the way physicians view these medications, which were considered miracle drugs when they first emerged in the 1930s. Within 2 decades, resistant strains of shigella and gonorrhea appeared. More recently, resistance has spread to pneumococcus and streptococcus, with some strains no longer responding to penicillin.

The emergence of a resistant pneumococcus strain, for example, concerns doctors because it makes treating many ear infections, bacterial pneumonia, and blood infections more difficult. In some instances, doctors begin treatment by prescribing vancomycin, a drug formerly considered the last line of defense.

That approach reflects a history of physicians fighting resistant bacteria with stronger antibiotics. "There was always some new miracle drug down the road," says John E. McGowan Jr. of Emory University in Atlanta, who also spoke at the April conference. "In the '90s, the well has run dry."

Drug companies slowed their research on new antibiotics during the late 1980s and early 1990s because of the increased cost and difficulty of bringing new agents to market. As an article in the Nov. 7, 1996 NEW ENGLAND JOURNAL OF MEDICINE points out, new strains of bacteria continued to develop during that time.

The research trend may now be turning around. Many companies have resumed their research, but new antibiotics remain years away, says McGowan.

Last summer, a Food and Drug Administration committee met to discuss strategies for slowing the development of resistance to new drugs. The panel recommended that professional societies take responsibility for educating doctors so that when new antibiotics do arrive, doctors and their patients will be wary of overprescription. Following procedures like the ones recommended by van Buchem can help, McGowan says.

McGowan acknowledges that "watchful waiting" can be inconvenient for parents who have to take their children to the doctor's office several times over the course of a long cold or sinus infection. However, the alternative may be more inconvenient—bacteria that don't respond to any antibiotic.

Educating both patients and physicians is the best way to keep bacteria from becoming resistant, McGowan says.

Stuart B. Levy of Tufts University in Boston, Mass., founded the Alliance for Prudent Use of Antibiotics in 1981 for that purpose. The group speaks to doctors, medical students, and the public about the dangers of overusing antibiotics.

Levy hopes to change prescriptive practices that contribute to antibiotic resistance. For example, he says, English children with ear infections don't receive antibiotics unless the infection progresses, whereas in the United States, parents expect their children to receive these drugs immediately.

The American Academy of Pediatrics continues to support the practice of prescribing antibiotics for ear infections.

Educating younger doctors and the current crop of medical students holds more promise than trying to change the way established physicians practice medicine. "It's a glacial process," Levy says. □

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Cannabis is an herb, not a drug. Herbs, when used in their naturally occurring state, can have extremely beneficial effects because of the unique mix of chemicals present in the plants. For example, coca has been used by indigenous Peruvians for thousands of years for its mildly stimulating effects, which help in dealing with steep hills and high altitudes. It is only when coca is concentrated into cocaine hydrochloride that it becomes the severely addictive, potentially deadly mix found on our streets.

It should also be recognized that THC [the active ingredient in marijuana] is nontoxic, unlike cocaine, heroin, and methamphetamine. There are numerous beneficial uses for cannabis in Chinese medicine and in the American materia medica before prohibition.

Lyle D. Courtsal
Seattle, Wash

Musings on menstruation

I notice that "Why Do Women Menstruate?" (SN: 4/12/97, p. 230) does not mention that the typical duration of a menstrual period is a lunar month nor what the significance of the "coincidence" is. When discussing the pros and cons of energy consumption, it did not note that the menstrual cycle can be interrupted by intensive exercise or insufficient food. Nor is any link established between the cessation of growth in stature with the onset of menstruation.

Is this absence due to oversight by the researchers or was the space available to discuss an intriguing puzzle too limited?

Martin Kappeyne
Pacific Palisades, Calif.

The latter. — J. Travis

On the subject of justifying human features in terms of evolutionary advantages, what about the advantages of male breasts, the appendix, tonsils, and wisdom teeth?

Alfred B. Kausel
Atlanta, Ga.

I beg to differ with both Profet and Strassmann regarding why women menstruate.

Menstruation was designed to benefit men!

For such an annoying and frequent event, the selective pressure must be through the reproductive system. What man would want to mate with a women who did not menstruate? Lack of menstruation indicates either that she is pregnant by a rival or that she is not healthy enough to bear children.

Why monthly? Anything as predictable as the moon provides a reliable measure for controlling a woman's behavior.

In England, the banns must be read for 3 weeks in the church before a wedding can take place. Surely in this amount of time the bride would demonstrate that she is not pregnant before the church sanctions the union. Perhaps I am extending my precepts too far here, but as your article mentions, the religious taboos surrounding this subject are extensive.

Susan Dean
San Jose, Calif.

Maybe the benefit of menstruation is that is discourages male sexual activity during the female's infertile days before estrus. This allows the male to accumulate a higher concentration of sperm and increases the probability of conception when sexual activity resumes after the period.

Gordon Foreman
Los Alamos, N.M.

Perhaps having an endometrium that has not been deteriorating for a long time creates a better chance of producing viable young.

Karl S. Veit
Springfield, Va.