

## Drug dosages often inappropriate for obese patients

by David Bearden & David Stauth

Portland - As if severely overweight people didn't already have enough health concerns, experts are raising another red flag - the possibility that some of their prescription medications, especially antibiotics, may not be prescribed at the appropriate dosage and could be ineffective.

Because most adult antibiotics are produced in a "one size fits all" dosage and some doctors are not attuned to this issue, the societal trend towards severe obesity is resulting in more individuals who get inappropriate drug therapies for infectious disease, a new study in the journal *Pharmacotherapy* suggests.

"The number of individuals with the highest body mass index, very obese people, is up 600 percent between 1986 and 2000," said David Bearden, a clinical associate professor in the College of Pharmacy at Oregon State University.

"Very obese individuals in some cases, even those with severe infections, may be getting only half the necessary dose of a prescription drug such as an antibiotic," Bearden said. "That's a problem. It could lead not only to antibiotic failure but also an increase in antibiotic resistance, another serious issue."

The problem is somewhat less of a concern with dosages of medications that patients take for extended periods, such as blood pressure or cholesterol medications, because the results of taking those medications are more routinely monitored and dosages can be increased as necessary. It's a particular concern with antibiotics, Bearden said, because they are often used to treat severe or even life-threatening infections, and "bad things can happen quickly if the drug is ineffective."

Drug companies are just now becoming more aware of this issue and beginning to test and recommend dosages more appropriate for adults of varying weights, Bearden said. But with older drugs that are commonly used, there often is very little or no data for adjusting dosages. In actual practice the issue is often ignored outright, or "educated guesses" are made with whatever data is available.

Without more attention, the issue may only get worse, and it's not just a U.S. phenomenon. The World Health Organization estimates that 400 million people were obese in 2005 and that the total will increase to 700 million by 2015. It considers these numbers a "global pandemic" that is affecting low, middle and high-income nations around the world. Obesity is also considered an independent risk factor for surgical site infections and is associated with higher mortality rates in critically ill patients.

Even if the problem is carefully considered, Bearden said, it's not simple.

“It would be nice if we could just use a simple multiplier to adjust drug dosages for overweight people,” Bearden said. “But it’s not that easy. There are a lot of factors that affect drug distribution in the body, including age, weight, kidney function, other disease problems and the type of antibiotic or other drug.”

Adipose tissue, or body fat, affects how the human body interacts with drugs. With some drugs it absorbs large amounts of a prescription medication, but with others, it doesn’t. And sometimes there is a very fine line between a drug being effective at one dose, ineffective if the dose is too low, and toxic if it’s too high. All of these issues affect appropriate dosages, and in many situations, the data needed to evaluate the problem simply doesn’t exist.

The issue of adjusted drug dosages has been known and addressed in children for decades, experts say, because of the obvious distinction between a 30-pound toddler and a 120-pound youngster. But with adults, far less attention has been given the problem. The medical and pharmaceutical industries often just assume that everyone weighs about 150-170 pounds.

“This is enough of an issue that if I were a very obese person being given an antibiotic, I would discuss it with my doctor,” Bearden said. “Hopefully the doctor will already have considered it and will be able to address your concerns. If not, then it’s a conversation you need to have, and more medical specialists, including pharmacists, may need to be consulted.”

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