Medical News

EDITED BY GINA PUGLIESE, RN, MS; MARTIN S. FAVERO, PHD

Antimicrobials in Animal Feed

Antimicrobial agents have been given to food animals in North America and Europe for nearly a half century. These agents often are given in the absence of disease, for subtherapeutic purposes, to promote growth. It has been estimated that 50% of all antimicrobials produced in the United States are administered to animals, mostly for subtherapeutic uses. The implications for humans has been the subject of an ongoing debate.

Three articles in the October 18, 2001, issue of the *New England Journal of Medicine,* accompanied by an editorial, addressed the use of antimicrobials in animal feed. White found that 20% of samples of ground meat obtained in supermarkets were contaminated with *Salmonella* and that 84% of the isolates were resistant to at least one antimicrobial. The authors note that other studies have shown that *Campylobacter jejuni,* another important human pathogen, frequently is isolated from meat, particularly poultry, available in supermarkets, and the incidence of fluoroquinolone-resistant strains has increased with the introduction of the therapeutic use of these drugs in animals.

A second study by McDonald found that at least 17% of chickens obtained in supermarkets in four states had strains of *Enterococcus faecium* resistant to quinupristin-dalfopristin, suggesting that development of resistance to *E faecium* is related to the use of virginiamycin in chicken feed.

The third study, by Sorensen found that glycopeptide-resistant and streptogramin-resistant strains of *E faecium,* isolated from chicken parts obtained at a grocery store and from pigs after slaughter, were able to colonize transiently (up to 14 days) the intestinal tract of healthy volunteers. They attributed the emergence of glycopeptide-resistant strains to the earlier widespread use of avoparcin in animal feed in Europe, noting that in 1997 its use was banned by countries in the European Union.

Gorbach, in an accompanying editorial, commented that the use of antimicrobials in food animals selects for resistant strains and enhances their persistence in the environment. Another concern is the horizontal spread of the resistance genes from bacteria in food animals to commensal strains in the intestinal microflora of humans.

On the basis of discussions by an expert committee of the Alliance for the Prudent Use of Antibiotics, several recommendations were made, including (1) antimicrobials should be used only when indicated in individual infected animals for a targeted pathogen and prescribed by a veterinarian; (2) the use of certain drugs that have important uses in humans, such as fluoroquinolones and third-generation cephalosporins, should be prohibited in animals; and (3) the subtherapeutic use of these agents to promote growth and feeding efficiency should be banned—a move that would decrease the burden of antimicrobial resistance in the environment and provide health-related benefits to both humans and animals.

FROM: White DG, Zhao S, Sudler R, Ayers S, Friedman S, Chen S, et al. The isolation of antibiotic-resistant *Salmonella* from retail ground meats. *N Engl J Med* 2001;345:1147-1154.

McDonald LC, Rossiter S, Mackinson C, Wang YY, Johnson S, Sullivan M, et al. Quinupristin-dalfopristin–resistant *Enterococcus faecium* on chicken and in human stool specimens. *N Engl J Med* 2001;345:1155-1160.

Sorensen TL, Blom M, Monnet D, Frimodt-Moller M, Poulsen RL, Esperson F. Transient intestinal carriage after ingestion of antibiotic-resistant *Enterococcus faecium* from chicken and pork. *N Engl J Med* 2001;345:1161-1166.

Gorbach S. Antimicrobials in animal feed: time to stop. *N Engl J Med* 2001;345:1202-1203.

Effect of Vancomycin and Cephalosporins on VRE in ICUs

Patient-specific risk factors for acquisition of vancomycin-resistant enterococci (VRE) among hospitalized patients are becoming well-defined. However, few studies have reported data on the institutional risk factors, including rates of antimicrobial use that predict rates of VRE. Identifying modifiable institutional factors can advance quality-improvement efforts to minimize hospital-acquired infections with VRE. Fridkin and colleagues from the CDC's Division of Healthcare Quality Promotion, the Intensive Care Antimicrobial Resistance Epidemiology (ICARE) Project, and the National Nosocomial Infections Surveillance System hospitals conducted a study to determine the independent importance of any association between antimicrobial use and risk factors for nosocomial infection on rates of VRE in ICUs. The study was a prospective ecological study in 126 adult ICUs from 60 US hospitals from January 1996 through July 1999. Included were all patients admitted to participating ICUs. Monthly use of antimicrobial agents (defined daily doses/1,000 patient-days), nosocomial infection rates, and susceptibilities of all tested enterococci isolated from clinical cultures were determined.

Prevalence of VRE (median, 10%; range, 0% to 59%) varied by type of ICU, as well as by teaching status and hospital size. Prevalence of VRE was strongly associated with VRE prevalence among inpatient non-ICU areas and outpatient areas in the hospital, ventilator-days per 1,000 patient-days, and rate of parenteral vancomycin use. In a weighted linear-regression model controlling for type of ICU and rates of VRE among non-ICU inpatient areas, rates of vancomycin use ($P<.001$) and third-generation cephalosporin use ($P=.02$) were independently associated with VRE prevalence.

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