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Letters to the Editor

Historical Yearly Usage of Glycopeptides for Animals and Humans: The American-European Paradox Revisited

Kirst et al. (5) in their letter on clinical use of vancomycin in the United States and major European countries state that "although it is well recognized that vancomycin resistance is more prevalent in the United States than in Europe, it has not been explained why avoparcin usage fails to correlate with the different epidemiologies of resistance between the two continents; avoparcin was never approved for use in animals in the United States, in contrast to its broad use as a growth-promoting agent in Europe."

I do not agree that vancomycin resistance is more prevalent in the United States than in Europe. In Europe, vancomycin-resistant *Enterococcus faecium* (VRE) is highly prevalent in the community (livestock, food, and humans) (8). In contrast, a zero prevalence has been found in healthy humans and in livestock in the United States (3, 7).

The frequent occurrence of VRE in the community correlates well with the use of large amounts of the glycopeptide avoparcin as a growth-promoting agent in livestock in Europe. A direct relationship between avoparcin usage and occurrence of VRE in livestock has been shown (1, 2). In Denmark, with a population of 5.2 million inhabitants, 24 kg of active vancomycin was used for humans in 1994. In comparison, 24,000 kg of active avoparcin was used for swine and broilers the same year. Thus, the amounts of active avoparcin used for livestock in Denmark in 1994 exceeded the total clinical use of vancomycin in the United States and in Europe in 1994 (Table 1)! Data on total use of avoparcin in Europe is unfortunately not available.

TABLE 1. Yearly use of glycopeptides for animals and humans in the United States and some European countries

Yr	Glycopeptide usage (kg of active substance)/yr		
	Vancomycin used for humans (oral and injectable)[a]		Avoparcin used for animals[b] (oral)
	U.S.	Europe[c]	Denmark
1984	2,000	303	NA[d]
1985	2,600	413	NA
1986	3,700	461	NA
1987	5,000	579	NA
1988	6,000	756	NA
1989	7,600	1,251	13,644
1990	8,299	1,257	13,718
1991	9,794	1,515	23,153
1992	10,690	1,666	17,210
1993	11,364	1,954	19,572
1994	11,460	2,256	24,117
1995	11,279	2,528	5,690[e]
1996	11,200	2,858	0

[a] Data on human glycopeptide use are from reference 5.
[b] Data on use of avoparcin as a growth promoter for pigs, broilers, and turkeys are from the Danish Plant Directorate.
[c] France, Germany, Italy, United Kingdom, and The Netherlands.
[d] NA, data not available; avoparcin was approved for use in Denmark in 1974.
[e] Avoparcin was banned in May 1995 in Denmark. The use was voluntarily suspended by the swine producers in April 1995.

Avoparcin was never approved for animals in the United States due to its carcinogenic effect (6). This correlates well with the absence of VRE in healthy humans and livestock in the United States.

The incidence of human infections with VRE is higher in the United States relative to Europe. This correlates with a high usage of vancomycin in hospitals in the United States and a lower usage in Europe (5).

The most likely sources of VRE in European hospitals are community sources (6, 8). The primary sources of VRE in hospitals in the United States are not known. I propose that likely sources of VRE in the United States are travel, tourists, and imported food. With a high consumption of vancomycin in hospitals, even rare introductions of VRE may lead to a high incidence of infection because of the extreme tenacity of this organism and its capability of causing nosocomial outbreaks (4, 6).

Considering the huge community reservoir, the incidence of VRE infection in Europe would probably surpass that in the United States were the use vancomycin to reach similar levels. Using last-resort antibiotics as growth promoters appears to present an unacceptable public health risk.

We need data on antibiotic consumption to understand the epidemiology of antibiotic-resistant bacteria. I therefore welcome the initiative of Kirst et al. (5). To my mind, monitoring of antibiotic resistance in bacteria and consumption of antibiotics must go hand in hand.

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Ed. Note: The authors of the original letter did not feel that a response was necessary.