

## Letters to the Editor

### Historical Yearly Usage of Vancomycin

The reasons for the emergence and spread of vancomycin-resistant enterococci are not yet fully understood. Nevertheless, various hypotheses and proposals which are being vigorously and extensively debated have been advanced (1-7, 10, 11, 15, 17, 19). The use of avoparcin, another member of the glycopeptide class of antibiotics, as a growth-promoting agent in the production of food animals is often cited as playing a role in the spread of glycopeptide-resistant microorganisms (1, 18, 20). 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 (5, 7, 10).

In order to find correlations and explanations, several studies have attempted to document the clinical usage of vancomycin, but these studies have necessarily been relatively limited in the scope of their survey (11, 12, 14, 16). The present report provides a much more complete description of the overall usage pattern of vancomycin over a period of more than 20 years (Fig. 1). The data for the years 1975 to 1983 were compiled from the Lilly database during the period in which Lilly was the sole supplier of vancomycin. The data for the years 1984 to 1996 have been obtained from IMS International.

Vancomycin use began to accelerate in the early 1980s, beginning a trend that further accelerated when oral formulations of vancomycin became available in the mid-1980s. However, it should be noted that oral use of vancomycin long preceded the appearance of commercial oral formulations, because the injectable formulation could simply be administered in an oral manner (9, 13). Orally administered vancomycin is not absorbed and is used to treat intestinal infections, especially those associated with *Clostridium difficile*. There is continuing debate concerning the respective roles of parenteral versus oral modes of vancomycin administration as risk

TABLE 1. Yearly vancomycin usage (all suppliers, all forms) in the United States and major European markets

Year	Vancomycin usage (kg) per yr <sup>a</sup>											
	United States		France		Germany		Italy		United Kingdom		Netherlands	
	Inj.	Oral	Inj.	Oral	Inj.	Oral	Inj.	Oral	Inj.	Oral	Inj.	Oral
1984	1,900	100	200	0	21	0	26	0	42	5	9	0
1985	2,300	300	300	0	26	0	29	0	45	5	8	0
1986	3,200	500	300	0	40	0	43	0	55	9	13	1
1987	4,300	700	300	24	84	0	69	0	70	11	19	2
1988	5,300	700	380	36	145	0	83	0	79	14	15	4
1989	6,800	800	400	430	165	0	105	0	112	16	17	6
1990	7,200	1,000	650	57	213	0	168	0	116	17	30	6
1991	8,781	1,013	828	47	245	0	211	2	121	23	33	5
1992	9,355	1,335	798	59	354	0	212	20	144	34	39	6
1993	9,984	1,380	975	64	350	0	261	28	181	42	45	8
1994	10,152	1,308	1,086	65	371	0	375	33	207	64	47	8
1995	10,186	1,093	1,066	59	509	0	471	40	259	61	54	9
1996	10,312	888	1,165	57	629	0	553	45	301	48	52	8

<sup>a</sup> Inj., injectable.

factors for the development and spread of vancomycin resistance (11, 15). Vancomycin usage continued to rise rapidly worldwide throughout the 1980s and early 1990s. The slight decline after 1994 reflects the beginning of attempts to restrict vancomycin use in response to concerns about the spread of vancomycin-resistant bacteria (8).

A more-detailed account of vancomycin usage by both the intravenous and oral formulations over the past 12 years within several major markets is presented in Table 1. These data were obtained from IMS International. First, it is readily apparent that greater quantities of vancomycin were used in the United

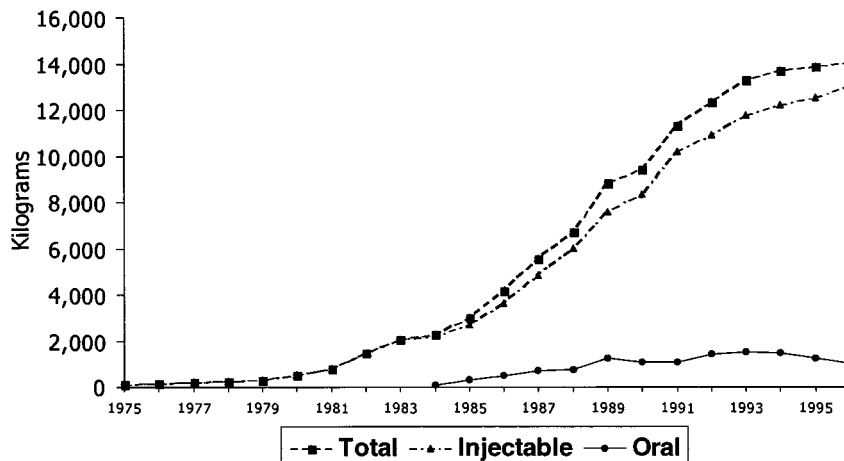


FIG. 1. Usage of vancomycin (in kilograms) in the United States, France, Italy, Germany, United Kingdom, and The Netherlands.

States than in the major European countries. Second, use of the oral formulation increased during the 1980s.

One conclusion from these data is that the high level of vancomycin use in the United States relative to the amount used in Europe correlates well with the greater prevalence of vancomycin resistance found in the United States relative to that found in Europe. In view of these data, the need to invoke a second mechanism for the spread of vancomycin-resistant bacteria in humans due to avoparcin use in Europe remains open to debate. Concern regarding the high level of vancomycin usage in U.S. hospitals and its role in the development and spread of vancomycin-resistant organisms has already been expressed (6).

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