Letters to the Editor

More Comments on IV Filter Debate

To the Editor:

Frankly, an exchange of letters in your September 1987 issue' and the Product Commentary concerned seem to cloud important issues more than clarify them. Brief mention is made of studies, and inferences are drawn without detailed summary of supportive evidence from those studies.

Considerable attention is drawn to the report by Quercia et al,[2] in which a highly sensitive method is used to detect contamination of IV administration sets containing real or blank filter cartridges. The study is double-blinded and stated to be randomized, although the method of random assignment is not provided. It purports to support a conclusion that IV filters could be supplied to all ICU patients in that center for an annual cost of approximately $5,700 versus annual treatment costs of $168,000 for currently unprevented septicemic episodes.

However, it is difficult to interpret the data of Quercia et al for several reasons. First, on what basis can one assume that all bacteremias detected during the study were attributable to the IV sets? Thirteen episodes were detected; the authors state that five of ten involved blank filterset patients with blood culture isolate(s) matching their filterset isolate(s). What of the other five? "The microorganisms isolated from the blood of the remaining bacteremic patients with blank filtersets were the same as those isolated from *other* contaminated filtersets." This finding suggests a definite lack of concordance, complicated by an absence of clear data stratification in 2 × 2 tables and/or statistical analysis. If one generously assumes that all bacteremic episodes were IV-attributable, then a statistically significant relationship (by Fisher's exact test) is demonstrated; but, if one discounts the five nonconcordant isolates in blank sets then the relationship is not statistically significant. If one discounts the three bacteremias in real filterset patients by a similar percentage, the adjusted 2 X 2 table still fails to demonstrate statistical significance (Table).

	Real Filter	Blank Filter	Real Filter	Blank Filter	Real Filter	Blank Filter
Bacteremia	3	10	3	5	1	5
No bacteremia	33	24	33	29	35	29
	P=0.024		P=0.323		P=0.087	

Furthermore, even assuming that all "42 clinically significant hospital-acquired bacteremias" found during the fiscal year of the investigation by Quercia et al were IV-associated, the implication that $168,000 in costs (42 septic episodes × $4,000 treatment cost/episode) is preventable isn't precisely correct. Thirty-six filterset patients suffered as many as three IV-associated infections, giving a risk of up to 3 of 36 or 8%; 34 blank set patients presumably suffered five IV-associated infections, giving a risk of 15%. Assuming that filters had a protective effect (in spite of the relationship possibly not demonstrating statistical significance), then the Prevented Fraction among Exposed" (to filter) is as low as 43% and no higher than 72%. If we assume all 42 bacteremias to be IV-associated, then *$72,240 (= $168,000 × 0.43)* is a more conservative estimate of projected savings; if we assume only half to be IV-associated, then projected annual savings drop to just over $36,000. Next, consider that Quercia's 13 septic episodes among 70 intensive care unit patients indicates an attack rate of 19% (from IV-associated infection alone!): if one's ICU infection rates do not indicate that high a risk, as must certainly be the case in many hospitals, then projected savings drop further still.

My purpose is not to criticize a single study of filter value in IV therapy out of context, but rather to lament the superficial treatment of important epidemiologic and economic considerations in an otherwise excellent publication. Product Commentaries in *Infection Control and Hospital Epidemiology* deserve more scientific rigor.

David Birnbaum, MPH
Applied Epidemiology
Sidney, British Columbia, Canada

REFERENCES

1. Gurevich I, Simmons B, Weinstein SM: IV filter debate continues (letter). *Infect Control* 1987; 8:347-349.
2. Quercia RA, Hills SW, Klimek JJ, et al: Bacteriologic contamination of intravenous infusion delivery systems in an intensive care unit. *Am J Med* 1986; 80:364-368.
3. Kleinbaum DG, Kupper LL, Morgenstern H: *Epidemiologic Research*. Belmont, California, Wadsworth, Inc, 1982, formula 9.16.

Ms. Gurevich responds to Mr. Birnbaum's letter:

Mr. Birnbaum's point is eloquently made and in total agreement with my own views. The Quercia article he critiques, and for the reasons he clearly states, is not "one of the best articles supporting the use of filters," which is a quote from Dr. Simmons' letter *(Infect Control* 1987; 8:347-349). 1 did not quote the article because, like Mr. Birnbaum, I found that the conclusions reached by Quercia et al were not supported by the study. It seems that Mr. Birnbaum, Dr. Simmons, and I are in agreement about the routine use of IV final filters-they do not prevent infections and are, therefore, not cost-effective.

Inge Gurevich, RN, MA, CIC
Winthrop-University Hospital
Mineola, New York

https://doi.org/10.1017/S0899823X00093776 Published online by Cambridge University Press