Letters to the Editor

Alternative to IV Filter Usage

To the Editor:

I am writing to address an article that recently appeared in the *New England Journal of Medicine* and that supported the routine use of IV filters.[1] In the article, the authors, Falchuk et al, showed that filters reduced phlebitis but they did not do an analysis of cost-effectiveness. The authors missed the most important consideration concerning IV filters when they failed to discuss cost-effectiveness of filters. I disagree with them that the "enormous benefits" of IV filters are likely to override cost concerns.

It is important to attempt to limit phlebitis. However, there are better and more cost-effective ways than using filters. Good care of the IV site will not only prevent phlebitis but probably also limit infection.[2,3] IV filters have never been shown to prevent infections, which are the most important IV-related complication, and are unlikely to do so, given the apparent rarity of infusate-related bacteremia.[4,5] When the authors talk about the systemic manifestations of phlebitis, they leave the impression that filters will prevent infections by preventing phlebitis. While phlebitis can be caused by both infections and particulates, there is no evidence that particulate-related phlebitis leads to infection. It is as easy for me to believe that the inflammatory response to chemical phlebitis will protect against infection as predispose to it. Unfortunately, it is not possible by a clinical examination to distinguish infection-related phlebitis from that due to other causes, so one must remove the catheter for clinically-significant phlebitis.

A pharmacy-based filtration program is a far more reasonable and cost-effective solution to particulates than is routine use of IV filters. Drugs known to have high particulate loads can be filtered through a particulate-grade filter incorporated in a needle. By batching multiple orders for the same drug, numerous solutions can be compounded by use of the same filter. In addition, these needle filters cost a fraction of that for in-line IV filters.

Probably the most reasonable approach to preventing particulate-related phlebitis is that taken by the Food and Drug Administration (FDA) and United States Pharmacopeia (USP). They have developed standards that limit the amount of particulates allowed in IV fluids. The papers quoted by Falchuk that show the presence of significant amounts of "starch granules, talc, silica, or glass" in IV fluids all predate the FDA and USP standards (which were finalized in the late-1970s).[6] Further, the FDA and USP are in the process of developing standards for particulates in both additives and IV administration tubing.[7]

When one considers the costs of IV filters, one needs to evaluate the costs of the filters themselves as well as costs associated with their use (hidden costs). These filters impede the flow of fluid and, thus, infusion pumps, frequent changes of IV tubing, and the time-consuming irrigations of the IV line may all be required. Just the costs of IV filters alone can be staggering. A 120-bed hospital for which I consult was spending $40,000 a year on filters and charging patients over $120,000 a year. Nationwide, costs would be enormous. It is estimated that routine use of IV filters could require more than 100 million filters annually.[8] Thus, use of filters could cost hospitals $100 to $200 million annually and cost patients three times that amount.

IV filters do reduce concentrations of some drugs.[9,10] Unless all drugs are studied for the characteristic of being removed by filters, I do not believe we can dismiss this problem as insignificant. I am not sure that all physicians will be aware of the problems of filtering drugs given in low dosages; some patients may receive sub-therapeutic concentrations of drugs.

Lastly, the phlebitis rate determined in the study by Falchuk was almost surely inflated with what I will call clinically insignificant phlebitis. In order to reduce the number of patients necessary to conclude their study, ie, to increase the power of their study, they apparently used a minimal, albeit fair, definition of phlebitis. The clinical significance of mild phlebitis (eg, mild redness and mild pain) is questionable. Certainly, other experienced investigators have found rates of phlebitis much less than the 57.2% rate reported by Falchuk.[3,11,12] One multi-hospital study of IV complications found a phlebitis rate of 2.3%.[13] This rate more closely reflects what most clinicians would call significant phlebitis.

Infection control personnel should await more data before using IV filters for all patients. Hospital cost control is an important topic in the 1980s, and infection control personnel should lead the way in this area. Certainly, now is not the time to adopt new expensive procedures unless there is solid evidence that benefits will approach costs; this is why the Centers for Disease Control specifically recommends against routine use of IV filters.[14]

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Editor's Note: In the February 1985 issue of *Infection Control,* Figures 1 and 2 in "Resistance to Antibiotics in Clinical Isolates of *Klebsiella pneumoniae*" were transposed (*Infect Control* 6(2):65). The Editors apologize for any confusion this may have caused our readers or authors.

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