Peritoneal Dialysis International, Vol. 16, pp. 446–447
Printed in Canada.

0896-8608/96 $3.00 + .00

IS IT POSSIBLE TO DECREASE THE RATE OF *STAPHYLOCOCCUS AUREUS* PERITONITIS?

Staphylococcus aureus peritonitis is frequently a devastating infection, resulting in severe abdominal pain, prolonged hospitalization, and catheter loss (1). The paper by Wanten *et al.* (2) confirms previous reports that patients who are *S. aureus* nasal carriers are at increased risk of *S. aureus* peritonitis (3,4). Can we reduce the risk of *S. aureus* peritonitis in this high-risk population? The answer is yes. Several protocols are effective in diminishing the risk of *S. aureus* infections (Table 1).

Cyclical oral rifampin (300 mg twice a day for five days, every 12 weeks) markedly reduced *S. aureus* catheter infections compared to placebo, but the reduction in *S. aureus* peritonitis was insignificant (0.11/year vs 0.16/year in placebo), perhaps because the mean follow-up time was only ten months in the rifampin-treated group (5). However, a subsequent study from the same center showed that intermittent prophylactic rifampin was an independent predictor of a reduction in peritonitis (6). At the University of Pittsburgh Medical Center we also found rifampin to be effective in reducing *S. aureus* peritonitis to 0.02/year, compared to a rate of 0.16/year during the historical period (7).

Intranasal mupirocin, highly effective in eliminating *S. aureus* in the nares, decreased *S. aureus* peritonitis from a previous rate of 0.21/year to 0.02/year, with a concomitant reduction in *S. aureus* catheter infections (8). Positive nose cultures were treated with 2% mupirocin nasal ointment three times a day for seven days; this was repeated as necessary for subsequent positive nose cultures. In contrast, in a multicenter prospective randomized trial, intranasal mupirocin, twice daily for five days given every month to nasal carriers, did not reduce *S. aureus* peritonitis rates (0.16/year in the mupirocin group compared to 0.23/year in the placebo group), although there was a dramatic lowering of *S. aureus* exit-site infections in the mupirocin group (9).

Convinced by the work of Zimmerman *et al.* (5)in 1992, we began a randomized trial to examine the effectiveness of daily exit-site mupirocin compared to cyclical rifampin (7). The two groups had equivalent numbers of nasal carriers. Both protocols reduced *S. aureus* catheter infections, and, to a lesser extent, *S. aureus* peritonitis. Indeed, the rates of catheter-related peritonitis fell from 0.14/year in the period prior to prophylaxis to 0.05/year after prophylaxis was introduced, a decrement entirely due to a decrease in *S. aureus* peritonitis (10).

Therefore, convincing data now exist to indicate that prophylaxis is effective in reducing the risk of *S. aureus* peritonitis. Several questions remain. Should only carriers be treated? Probably, since noncarriers have minimal risk of *S. aureus* peritonitis, as shown in the paper by Wanten *et al.* (2). Which protocol is preferred? There are no data demonstrating superiority of one protocol over another. Rifampin is contraindicated in patients with liver disease, in those patients on warfarin, or who wear contact lenses (which become stained), and results in significant side effects in 12% of patients, primarily nausea and vomiting. Resistance develops, which then makes this drug not available to treat infections. Intranasal mupirocin is safe and effective in eliminating nasal carriage. The application of mupirocin to the exit site is also safe, effective, and is very acceptable to the patient, which enhances compliance. However, mupirocin should not be applied to polyurethane catheters as damage to the catheter may result. If resistance to mupirocin develops, then little is lost, since this is not a drug used to treat peritonitis. Each center should decide on a regimen of prophylaxis, then implement it in patients who are *S. aureus* nasal carriers.

TABLE 1
Prophylactic Protocols for Prevention of *Staphylococcus aureus* Infections in PD Patients

Rifampin	300 mg 2 times daily for 5 days every 12 weeks
Intranasal mupirocin	3 times daily for 7 days for each positive nose culture
Intranasal mupirocin	2 times daily for 5 days each month
Exit-site mupirocin	applied daily as part of routine care

Beth Piraino

Department of Medicine
University of Pittsburgh Medical Center
Pittsburgh, Pennsylvania, U.S.A.

REFERENCES

1. Kim D, Tapson J, Wu G, Khanna R, Vas SI, Oreopoulos DG. *Staph aureus* peritonitis in patients on continuous ambulatory peritoneal dialysis. *Trans Am Soc Artif Intern Organs* 1984; 30:494–7.
2. Wanten GJA, van Oost P, Schneeberger PM, Koolen MI. Nasal carriage and peritonitis by *Staphylococcus aureus* in patients on continuous ambulatory peritoneal dialysis: a prospective study. *Perit Dial Int* 1996; 16:352–6.
3. Luzar MA, Coles GA, Faller B, *et al. Staphylococcus aureus* nasal carriage and infection in patients on continuous ambulatory peritoneal dialysis. *N Engl J Med* 1990; 322:505–9.
4. Lye WC, Leong SO, van der Straaten J, Lee EJC. *Staphylococcus aureus* CAPD-related infections are associated with nasal carriage. In: Khanna R, ed. Advances in peritoneal dialysis. Toronto: Peritoneal Dialysis Publications Inc., 1994; 10:163–5.
5. Zimmerman SW, Ahrens E, Johnson CA, *et al.* Randomized controlled trial of prophylactic rifampin for peritoneal dialysis-related infections. *Am J Kidney Dis* 1991; 18:225–31.
6. Oxton LL, Zimmerman SW, Roecker EB, Wakeen M. Risk factors for peritoneal dialysis-related infections. *Perit Dial Int* 1994; 14:137–44.
7. Bernardini J, Piraino B, Holley J, Johnston JR, Lutes R. A randomized trial of *Staphylococcus aureus* prophylaxis in peritoneal dialysis patients: mupirocin calcium ointment 2% applied to the exit site versus cyclic oral rifampin. *Am J Kidney Dis* 1996; 27:695–700.
8. Perez–Fontan M, Garcia–Falcon T, Rosales M, *et al.* Treatment of *Staphylococcus aureus* nasal carriers in continuous ambulatory peritoneal dialysis with mupirocin: long-term results. *Am J Kidney Dis* 1993; 22:708–12.
9. Coles, GA. The Mupirocin Study Group. The effect of intranasal mupirocin on CAPD exit site infection. *J Am Soc Nephrol* 1994; 5:439.
10. Gupta B, Bernardini J, Piraino B. Peritonitis associated with exit site and tunnel infections. *Am J Kidney Dis* (in press).