

## Bacteriuria in nursing home patients

This learning project was stimulated by an article {Walker et al., 2000, CMAJ, 163, 273-7} which looked at why urine cultures are ordered and why antibiotics are prescribed for institutionalized elderly. The article concluded that because there was no evidence for an association between nonspecific signs and symptoms and the presence or absence of bacteriuria, using those nonspecific signs and symptoms as the basis for ordering cultures and antibiotics is not warranted. The authors base this on two articles {Berman et al., 1987, Age Ageing, 16, 201-7; Boscia et al., 1986, Am J Med, 81, 979-82}.

Looking at the abstracts for these two articles is instructive. Whereas the nonspecific signs and symptoms reported by nurses and physicians in the Walker study were typically based on observation of the residents who frequently have cognitive impairment and are unable to articulate their symptoms, the Boscia study questioned patients about both specific and nonspecific symptoms such as anorexia, difficulty in falling asleep, difficulty in staying asleep, fatigue, malaise, weakness. Such self-reported symptoms may have little to do with observations of increased restlessness or confusion, irritability, crying, aggression, agitation, uncooperativeness, falling, or eating less that were identified by the Walker study clinicians.

The Berman paper involved institutionalized elderly veterans. They looked carefully for signs of infection when there was functional decline, and in fact found infection (and we assume treated those infections) in 50 out of 65 instances of functional decline during the 6-month surveillance period. The death rate dropped during the 6 months and returned to baseline afterwards, which supports the idea that looking for and treating infection is a good idea when there is functional decline. It should be noted that the Walker article refers to the infections in the Berman study as being urinary tract infections, but the type of infection is not mentioned in the title or abstract of the Berman paper.

The Walker paper also refers to five studies which purport to provide “compelling evidence to support not treating asymptomatic bacteriuria in elderly residents of long-term care facilities” {Boscia et al., 1987, JAMA, 257, 1067-71; Ouslander et al., 1995, Ann Intern Med, 122, 749-54; Abrutyn et al., 1994, Ann Intern Med, 120, 827-33; Nicolle et al., 1987, Am J Med, 83, 27-33; Nicolle et al., 1983, N Engl J Med, 309, 1420-5}.

Let's look at each of these articles in turn. The Boscia paper looked at elderly ambulatory nonhospitalized women, and showed that antibiotic therapy for nonsymptomatic bacteriuria halved the rate at which symptomatic UTI developed in the subsequent 6 months.

The Ouslander article studied nursing home residents with chronic urinary incontinence, who had otherwise asymptomatic bacteriuria. Eradication of the bacteriuria had no effect on the severity of the chronic incontinence.

The Abrutyn article looked at elderly ambulatory women in retirement communities without urinary catheters. An observational study using urine cultures every 6 months showed that infected residents had almost double the mortality rate compared to uninfected residents; however, infected residents were also older and sicker. The infected residents were divided into a treatment group and a no-treatment group; no mention is made in the abstract of randomization or of blinding, or of placebo controls. Nevertheless, although treated residents had a slightly lower mortality (13.8 per 100,000 vs 15.1 per 100,000) the difference was not statistically significant.

The Nicolle study on 50 institutionalized elderly women (I have the full article) found a high incidence (about 50%) of bacteriuria based on monthly urine cultures over 12 months. Half of the 50 women were randomly assigned to receive antibiotic treatment for positive urine cultures; the other half received no treatment, unless symptoms developed. The treated group had a rate of 0.67 incidents per patient-year of genitourinary morbidity, vs 0.92 for the no-therapy group (non-significant difference) but had a significantly higher rate of adverse drug effects. Nine of 23 treated patients died during the study year, compared to 4 of 22 untreated patients (non-significant difference). The study certainly demonstrates that there is no benefit to a protocol which screens all residents for bacteriuria regardless of symptoms, functional decline, or other triggers for testing, and then treats positive culture results. No benefit, and likely there is harm. But the study does not address outcomes if testing is based on whether there are clinical triggers such as increased confusion or falling.

Finally, the earlier Nicolle study which looked at all noncatheterized male residents on two geriatric wards over a 2-year period. Monthly urine samples were obtained. Positive cultures were treated with single doses of either trimethoprim/sulfamethoxazole or tobramycin. 36 of 88 men who had been re-infected or failed the single-dose treatment were randomized to either eradication therapy or no treatment. The rates of mortality and infectious morbidity were similar in the two groups. Again, this study is based on screening all residents rather than testing only residents where there is some justification for it.

Lindsay Nicolle is a very prolific writer: a medline search on her name and the term "bacteriuria" turned up 52 hits. However, there is only one additional study involving treatment in institutionalized elderly {Nicolle et al., 1988, *Age Ageing*, 17, 187-92}. This article appears to be a report on 26 of the patients previously reported in {Nicolle et al., 1987, *Am J Med*, 83, 27-33}.

I failed to turn up any studies of treatment in institutionalized elderly who were found to be bacteriuric when testing was initiated in response to nonspecific symptoms such as increased restlessness or confusion, irritability, crying, aggression, agitation, uncooperativeness, falling, or eating less.

I propose we do such a study, perhaps together with Maimonides, and making use of our new linkage with McGill.