

Reduced Dosage of Ceftriaxone for Uncomplicated Gonorrhea in Women

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A number of papers¹⁻⁸ have recently suggested that a reduced dose of 125 mg of ceftriaxone is effective against *Neisseria gonorrhoeae*. Several studies have shown that a reduced dose is effective even against infection that has been caused by penicillinase-producing strains of *N gonorrhoeae*.^{8,9} The Centers for Disease Control (CDC) and the World Health Organization^{10,11} continue to advise using the manufacturer's recommended single dose of 250 mg for uncomplicated gonorrhea. In 1985 the CDC stated that although some investigators had reported therapeutic success with a dose of 125 mg, insufficient data precluded a general recommendation for this dose. The major concern was that the use of the 125-mg dose might accelerate the development of strains resistant to ceftriaxone.¹² A thorough review of the literature and an ongoing surveillance program at the Public Health Laboratory of the County of Orange (California) has thus far not shown emergence of ceftriaxone-resistant strains of *N gonorrhoeae*.

METHODS

The County of Orange Health Care Agency maintains a unique facility in the Orange County Women's Jail. This facility, which is maintained as an entity separate from the jail's main medical treatment clinic, offers complete medical treatment for sexually transmitted diseases to all inmates. Special emphasis is placed on chemoprophylactic treatment in those who have been arrested for prostitution. Although any inmate may request an examination in the facility, individuals who have been arrested for drug-related offenses or prostitution are automatically screened

by one of the facility's trained health professionals. Examinations are performed on a totally voluntary basis.

Individuals who consent are given a comprehensive examination that consists of serologic tests for syphilis and human immunodeficiency virus and a pelvic examination performed by a physician. Routine tests are performed for trichomonas, yeast infections, and bacterial vaginosis, and cultures are performed for gonorrhea and chlamydia. Papanicolaou smears are routinely done on most patients. Samples taken from the pharynx and rectum are cultured for gonococcus if indicated by the patient's history. Immediate treatment is given for any disease found on the clinical and microscopic examination. In addition, all those women who have been arrested for prostitution are offered chemoprophylactic treatment for syphilis and gonorrhea.

The chemoprophylactic treatment that is offered depends on the expected length of incarceration in the facility. Those women who expect to stay at least 30 days are given 125 mg of ceftriaxone intramuscularly, and a repeat serologic test for syphilis is scheduled to make certain that any case of incubating syphilis is not missed. Women who are not expected to remain in the jail for 30 days are given 2.4 million units of penicillin G benzathine and 125 mg of intramuscular ceftriaxone if they are not allergic to penicillin. Spectinomycin is used for penicillin-allergic patients. Individuals with cervicitis and presumed chlamydial infections are given doxycycline, if not pregnant. Patients with pelvic inflammatory disease were treated appropriately according to CDC guidelines. All inmates are asked to obtain follow-up treatment at the Orange County Sexually Transmitted Disease (STD) Clinic upon release.

In the past 3 years there have been no refusals for this totally voluntary screening and treatment program. Inmates often request examination and treatment even before being screened by the health professionals. The incarceration of these patients who remain at least 30 days provides an ideal setting for a prospective evaluation of

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the efficacy of treatment of gonorrhea, since reinfection and loss of follow-up are not possible.

RESULTS

Over a 31-month period, 2430 initial examinations were performed. Of those women examined, 877 inmates were administered some form of chemoprophylactic therapy. Of these women, 218 were found to have cultures positive for *N gonorrhoeae*. There were a total of 135 cases of chlamydia in this group of patients, 42 of whom also were found to have coexisting gonorrhea. Patients who had additionally received penicillin G benzathine or doxycycline or ceftriaxone in a dose higher than 125 mg were not included in this study.

Of the 65 patients who received 125 mg of ceftriaxone intramuscularly, there were no treatment failures for gonorrhea infection as determined by test of cure that was performed subsequent to therapy. Of the women treated, 12 patients had pharyngeal infection, 1 patient had rectal infection, and 1 patient had both pharyngeal and cervical infection. The majority, 51 patients, however, had cervical infection only. Confidence interval (CI) for a sample of 65 patients is .992, 1.0. For specific infection sites, there were 51 cervical (CI = .99, 1.0), 12 pharyngeal (CI = .95, 1.0), 1 rectal (CI = .50, 1.0), and 1 oral and cervical (CI = .50, 1.0). An adequate test-of-cure examination for patients treated with ceftriaxone alone was defined by negative cultures for *N gonorrhoeae* from all previously infected sites within 21 days after treatment.

DISCUSSION

This prospective study is the largest to date in women treated with the 125-mg dosage. The results again confirm the efficacy of using a reduced dose of 125 mg of ceftriaxone for the treatment of uncomplicated gonorrhea. Despite the evidence of this and other reports, review-type articles continue to advise the use of the 250-mg dosage.¹³ In addition, the CDC, in its just-published 1989 *STD Treatment Guide*, continues to recommend the use of the 250-mg dosage.¹⁴ The major concern continues to be the possible emergence of ceftriaxone-resistant strains. Over the past 3 years the Orange County STD Clinic has routinely used the reduced dose. Ongoing surveillance at the Orange County Public Health Laboratory had found no evidence of resistant strains using this dosage, according to J. R. Greenwood, PhD, laboratory director (personal communication, 1989). It is likely that even with the reduced dose the blood levels of ceftriaxone exceed those required to eliminate even the most resistant *Neisseria*

gonorrhoeae organisms. Since no treatment failures are occurring, selection of resistant strains is highly unlikely.

There are two major advantages to using the reduced dose. First, the 125-mg dose, which has a volume of only 0.5 mL, can be more easily administered in the deltoid muscle. Second, the 125-mg dose is less expensive. The wholesale cost of a multiple-dose 1-g vial of ceftriaxone, which is the most economical size purchased in a STD clinic setting, is \$29.28.¹⁵ The cost of administering one 250-mg dose is therefore \$7.32. Using a reduced dose of 125 mg would result in a savings of \$3.66 per administration. The Orange County STD Clinic has ordered 760 1-g vials of ceftriaxone in the first 7 months of 1989. Currently, the smallest available dosage size of ceftriaxone is 250 mg. When reconstituted, the manufacturer-recommended refrigerated shelf life is 10 days. In a small practice setting, where ceftriaxone might be administered infrequently, the production by the manufacturer of a unit dose in the 125-mg size would be highly desirable. It is obvious, as evidenced by the findings of this study, that using a dose of 125 mg of ceftriaxone is effective and would result in a marked reduction in health care costs for the treatment of uncomplicated gonorrhea.

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