

RGH Pharmacy E-Bulletin

Volume 25 (2): February 19, 2007

A joint initiative of the Patient Services Section and the Drug and Therapeutics Information Service of the Pharmacy Department, Repatriation General Hospital, Daw Park, South Australia. The RGH Pharmacy E-Bulletin is distributed in electronic format on a weekly basis, and aims to present concise, factual information on issues of current interest in therapeutics, drug safety and cost-effective use of medications.

Editor: Assoc. Prof. Chris Alderman, University of South Australia – Director of Pharmacy, RGH

© Pharmacy Department, Repatriation General Hospital, Daw Park, South Australia 5041

Tuberculosis and the kidney

Tuberculosis (TB) is a relatively common disease caused by members of the *Mycobacterium tuberculosis* complex. This organism kills more people than any other infectious agent. Globally, it is estimated that 8 - 10 million new cases of TB are detected annually with a rising incidence, particularly in regions with a high incidence of HIV infection. TB most commonly affects the lung, but it can also affect many other organs such as kidneys, lymph nodes, liver, gastrointestinal tract and the central nervous system. In renal infection, TB almost always affects the kidney during the primary exposure to infection although it does not present clinically. Renal TB is usually haematogenously spread from the lungs, bone or a GI tract focus. Symptoms may not develop for many years, even decades, after the initial infection. Many patients present with lower urinary symptoms typical of “conventional” bacterial cystitis. Other symptoms include back, flank and suprapubic pain; hematuria; frequency; and nocturia. However, constitutional symptoms such as fever, weight loss and night sweats are unusual and only one third of patients have an abnormal chest X-ray. A tuberculous kidney may become calcified and non-functioning, and if advanced and bilateral, progression to end-stage renal failure may occur. If untreated, the end result is often autonephrectomy.

In the treatment of renal TB, antituberculosis drugs are effective. The antituberculosis treatment consists of modern short-course drug regimens, based on an initial 2-month intensive phase of treatment which usually involves four drugs - rifampicin, isoniazid, pyrazinamide and ethambutol. These first line drugs will usually destroy almost all tubercle bacilli and generally have an acceptable toxicity profile. Initial treatment is followed by a 4-month continuation phase of rifampicin and isoniazid to eliminate the few remaining near-dormant, persisting bacilli and to prevent relapse. For the antituberculosis drugs to be successful all doses must be taken. Failure to comply with therapy within the specified period is a major cause for treatment failure. The World Health Organisation has compiled guidelines of available regimens and more information from local guidelines is available at www.cdc.gov/mmwr/PDF/rr/rr5211.pdf. Surgical excision is usually indicated as an adjunct to antituberculosis therapy in cases of advanced unilateral disease complicated by pain or haemorrhage and for bladder augmentation.

Recently, there has been a worrying increase in the incidence of multidrug-resistant TB, which, by definition, is caused by bacilli resistant to rifampicin and isoniazid, with or without resistance to other drugs. In this instance, therapy consists of the use of five or six drugs that are selected (on the basis of drug susceptibility tests, from ethionamide, prothionamide, moxifloxacin, cycloserine, amikacin, streptomycin, rifabutin, capreomycin, and para-aminosalicylic acid). These second-line agents are generally less effective and often more toxic and/or costly than the first-line drugs. Duration of therapy is based on bacteriologic response but may be 18 months or longer.

Patients with impaired renal function need reduced doses of some antituberculosis drugs. Rifampicin, isoniazid, pyrazinamide, ethionamide and prothionamide may be given in normal doses as they and their metabolites are not renally cleared. However, care is required for the dosing of streptomycin and other aminoglycosides, as well as for ethambutol, as these drugs are excreted via the kidneys.

Peripheral neuropathy is a common complication of isoniazid and usually is preventable by coadministering pyridoxine. Rifampicin increases the rate of metabolism of various drugs, including antiretroviral therapy. In HIV-positive patients also receiving active antiretroviral therapy, rifabutin is given instead of rifampicin and the duration of therapy is extended to nine months.

Acknowledgment – This E-Bulletin is based on work by Shwu Fen Loh, Senior Pharmacist, RGH

FOR FURTHER INFORMATION – CONTACT THE PHARMACY DEPARTMENT ON 82751763 or email: chris.alderman@rgh.sa.gov.au
Information in this E-Bulletin is derived from critical analysis of available evidence – individual clinical circumstances should be considered when making treatment decisions. You are welcome to forward this E-bulletin by email to others you might feel would be interested, or to print the E-Bulletin for wider distribution. Reproduction of this material is permissible for purposes of individual study or research.