Extended Spectrum Beta-Lactamase at Princess Alexandra Hospital

The Princess Alexandra Hospital is the major acute-care adult hospital servicing the southern side of the City of Brisbane, and also provides specialised services to patients from other parts of Queensland and northern New South Wales. The hospital has around 900 beds, including a 12-bed intensive care unit. This description of the emergence and control of extended spectrum beta-lactamase (ESBL) producing Klebsiella pneumoniae was prepared by the hospital's Infection Control Scientist, Carolyn Wills.

ESBL-producing organisms are of special importance because they are so resistant that treatment options are limited to expensive antibiotics such as imipenem, and because of the potential for plasmid transfer among other members of the Enterobacteriaceae. ESBL stands for Extended Spectrum Beta-Lactamase and refers to the enzyme carried on the plasmid that induces the broad antibiotic resistance. ESBL-producing Klebsiella pneumoniae was first isolated in 1983, and was first described in Australia in 1988. Princess Alexandra Hospital is a large (approx. 900 beds), metropolitan teaching hospital on Brisbane's south side. The hospital is an acute-care adult institute which also has a large geriatric and rehabilitation unit, and a spinal injuries unit. At PAH, ESBL-producing Klebsiella pneumoniae was first isolated in December of 1991, and since then has been isolated in specimens from 138 other patients. In addition, there have been 13 ESBL-producing Enterobacteriaceae other than Klebsiella isolated. Urine has been the most frequent source of isolates, except in Intensive Care Unit patients, where the majority of isolates came from sputum specimens.

Following the introduction of a vigorous hand-washing campaign and isolation policy in late 1993, and restriction of third generation Cephalosporin use in early 1994, the rate of isolation of ESBL-producers has diminished substantially. The isolation policy means that unless there are overriding factors (eg. need for specialised care and/or rehabilitation facilities), the patient is transferred to the infectious diseases unit. In addition, the restriction on third generation Cephalosporin usage means that these antibiotics are available only for meningitis, epiglottitis and febrile neutropenics, unless special permission is obtained through the Director of Infectious Diseases.

It is known that many of these isolates represent colonisation, rather than infection, and it is thought that the primary site of colonisation is the rectum. However, while there has been much research into the time-frame of persistence of colonisation with other resistant organisms (eg MRSA), we do not have the same type of information for Klebsiella. At the current time, no special precautions are taken upon subsequent admission of these patients, providing treatment was received at the time of the initial isolation, and that no subsequent positive specimens have been documented.