Bacteriology of Urinary Tract Infection in Paraplegics

ANGELA E. DIKE (*Stoke Mandeville Hospital, Aylesbury*) An illustrated review was given of the last four years' experience, at Stoke Mandeville Hospital, of urinary tract infection in males with acute spinal injuries.

During the first stage of spinal shock most patients are managed by thrice daily intermittent catheterization until spontaneous micturition is established.

Urinary infection is frequent in the catheterized patients but there has been less in recent years.

The predominant organisms are *providencia*, *pseudomonas*, and *klebsiella* species; *E. coli* and *Strep. faecalis* are relatively rare. The first three of these organisms are often highly resistant.

Although *K. aerogenes* is often sensitive *in vitro* to nalidixic acid, this substance is useless *in vivo* because of the rapid development of resistance.

Gentamicin was the most frequently used antibiotic in the first two months after spinal injury.

Reduction in infection in recent years was achieved by encouraging a closer liaison between the wards and the laboratory, which began when a chart of the weekly urine culture results was kept in the laboratory. Hibitane was introduced as a urethral antiseptic before catheterization. Twice daily urine screening tests were started for the catheterized patients. Catheterization is done by medical staff, and a MacConkey plate is inoculated with a paper strip as part of the catheter routine. The plate is seen next day by both laboratory staff and clinicians, which maintains good communication and leads to early treatment of new infections.

Urinary Tract Infections in Paraplegics—Prevention

C. A. MORRIS (*Public Health Laboratory, Shrewsbury*) Patients with traumatic paraplegia are at risk of dying of renal failure as a complication of chronic pyelonephritis, calculosis, amyloidosis, or hypertension. This can be prevented by punctilious and skilled urological management aimed at helping the patient to develop a bladder which empties with only a small residual of urine; by preventing the introduction of microorganisms into the urinary tract, and by the speedy

eradication of urinary infection should this occur.

The prognosis and quality of life of these patients is greatly improved if the bladder is protected from damage by overdistension or infection during the early period after injury. This is best achieved in a spinal unit to which the patient should be admitted without delay. Intermittent urethral catheterization is preferable to other methods of emptying the bladder. A no-touch catheterization technique, urethral disinfection, and instillations of the bladder with disinfectants or antibiotics have proved valuable prophylactic measures. With expert care 80 to 90% of patients should leave hospital catheter free, with low residual urine and without bacteriuria. After care is necessary with regular tests of bladder function.

Preliminary results of a continuing study in the Midlands Spinal Injury Unit suggest that bladder instillations of polymyxin B with neomycin and bacitracin reduces urinary infections and also the frequency with which surgery is needed to relieve obstruction to the urinary flow. If urinary candidiasis develops this is usually associated with antibodies to *Candida albicans*. Progress to systemic candidiasis has not been seen and recovery is usually spontaneous and treatment unnecessary. *Candida* may be eradicated by alkalization of the urine but this increases the risk of forming calculi.

Chronic Granulomatous Disease

EILEEN N. THOMPSON (*Department of Paediatrics, Welsh National School of Medicine, Cardiff*) An account of the essential clinical features found in 92 recorded cases of chronic granulomatous disease, and the reason why phagocytic cells from these patients are unable to digest particular ingested organisms is discussed. A clinicopathological study of 10 boys and their first-degree relatives is described. The diagnosis of chronic granulomatous disease was established by the qualitative and quantitative nitro-blue tetrazolium test. Though the clinical features of this syndrome were typical a wide spectrum of clinical expression related to age of onset, periodicity, and chronicity of the infected lesions was noted and a significant correlation with the degree of abnormality in the NBT test was found. Hypergammaglobulinaemia was noted in nine of the 10 children.

In three mothers and one sister photo-

sensitive skin rashes (three) and a prolonged episode of polyarthritis (one) were noted; all of them had raised immunoglobulin levels. In six mothers and one father intermediate values for the NBT test was found; all had raised serum immunoglobulin levels. All the fathers were asymptomatic, but one had died previously of acute lymphatic leukaemia.

An X-linked form of inheritance seemed likely in six of the eight families studied.

Compensatory leucocytosis was a marked feature in all these patients, but seemed to be more striking in those with persistent symptoms. It was postulated that a period of neutropenia might be beneficial, in order to make the organisms more accessible to other bactericidal mechanisms, and so be instrumental in inducing an infection-free period. Three children were treated with busulphan. This was effective in one, had to be withdrawn in another because of the marked fall in the IgM level, and in the third, who was critically ill at the time treatment was started, the results were inconclusive.

Neutrophil Chemotaxis

P. C. WILKINSON (*University Department of Bacteriology and Immunology, Western Infirmary, Glasgow*) In recent years numerous substances chemotactic for leucocytes have been isolated. These may be exogenous, derived from sources such as bacteria, or endogenous, including products of activation of humoral enzyme systems such as complement, and products released from cells either following injury or by secretion from healthy cells.

A start has also been made in the study of the biology and biochemistry of the migrating leucocyte. Contact with chemotactic factors causes a metabolic burst in the responding cell. Depending on the conditions under which they are activated, neutrophil leucocytes may migrate by chemotaxis (directional migration in a chemical gradient), or chemokinesis (enhanced non-directional migration induced by chemical substances), or a combination of both. The mechanism by which neutrophils detect chemotactic substances but ignore other substances in their environment is beginning to be understood at the molecular level.

It is now apparent that defects in leucocyte migration in patients may arise for a variety of reasons and that these defects may be important in certain diseases associated with an increased