lines of the late Board of Control should be appointed without delay.[5] But, above all, there must be immediate attention given to the improvement of the staffing structure of nurses, doctors, and ancillary workers, and every inducement given by whatever means to improve recruitment. Cinderella can be transformed, but to turn a kitchen slut into a princess costs a lot of money. The money can and must be found if a once splendid service is itself to be rehabilitated.

Transverse Myelitis and Heroin Addiction

Acute inflammation of the spinal cord is fortunately an uncommon illness. When clinical evidence of damage is restricted to a few segments, it is traditionally designated transverse myelitis to distinguish it—when the level progressively rises—from ascending myelitis.

The clinical picture is distinctive. Severe local spinal pain often heralds the development of neurological symptoms and signs. Paralysis, which is usually flaccid, then appears in the lower limbs and ascends to the trunk. Sensory loss of varying severity is in clear-cut segments, often separated from unaffected dermatomes by a girdle of hypersensitivity. Acute retention of urine may be among the presenting symptoms, and subsequently defective control of bladder and bowel usually appears. In the acute phase tendon and plantar reflexes may be completely lost, but frank evidence of bilateral upper motor neurone lesions later becomes clear. It is imperative to exclude compression of the spinal cord, and there should be no delay in submitting the patient to myelography. During the acute phase the cord may be demonstrably swollen, and the cerebrospinal fluid contains an excess of cells and protein. At necropsy the affected segments of the cord show areas of demyelination, sometimes with severe destruction of tissue. In the early stages marked inflammatory reactions with lymphocytic cuffing of vessels may be apparent. In cases of longer duration, scarring and cavitation with neuroglial sclerosis is the dominant feature.

There are many possible causes of this catastrophic syndrome. It may complicate smallpox, measles, or chicken-pox and may be provoked by prophylactic vaccination. In a young adult multiple sclerosis may be suspected, and examination may give evidence of previous symptomless exacerbations such as pale optic discs or nystagmus. Though syphilitic myelitis is now rarely seen in the United Kingdom, acute vascular or ischaemic lesions of the spinal cord from degenerative arterial disease are not uncommon among the elderly. Toxic reactions to drugs have been well documented. In the past arsenicals, sulphonamides, and even contrast media have caused the condition. A recent report suggests that heroin addiction must also be considered.

Septic cerebral artery emboli, status epilepticus, meningitis, and injection neuropathies are neurological complications seen in addicts who administer heroin to themselves in unsterile conditions. R. W. Richter and R. N. Rosenberg have now described four patients who developed acute transverse myelitis. Three of them had not taken drugs for several months, and myelitis developed abruptly, soon after resorting to further intravenous heroin. In one patient, who died five weeks after resuming heroin, extensive necrosis of the spinal cord in the lower thoracic region was found at necropsy. It is well known that the "pusher" dilutes his drugs and that the addict has no means of knowing the strength of his injection except by the "kick" he receives. Thus it cannot be established whether the neurological damage is attributable to direct toxicity of heroin or to an adulterant. The fact that acute transverse myelitis developed after a period of abstinence might indicate a neurotoxic hypersensitivity reaction. It would seem that yet another miserable complication must be added to the list of physical hazards associated with heroin addiction.

[1] Richter, R. W., and Rosenberg, R. N., *Journal of the American Medical Association*, 1968, **206**, 1255.

Management of Primary and Secondary Hyperaldosteronism

Primary aldosteronism is an important cause of hypertension,[1] though the frequency of this association may have been overemphasized.[2] Patients with ischaemic renal disease[3] and accelerated and malignant hypertension[4] may also have raised aldosterone secretion rates. And secondary hyperaldosteronism may contribute to the clinical picture of the oedema found in cirrhosis of the liver and renal disease and lead to the partial failure of diuretic treatment in some patients with congestive cardiac failure.

Thus a potent aldosterone antagonist might be an effective therapeutic agent. Of the various drugs introduced for this purpose only spironolactone fulfils the criteria of being a true potent aldosterone antagonist[5] useful clinically. Another agent, triamterene, which was once considered to oppose the action of aldosterone directly,[6] is now known to act on the distal tubular mechanism of the kidneys independent of any aldosterone antagonism.[5]

Though spironolactone has been advocated from time to time for the management of hypertensive patients, a recent paper[7] is critical of the results of such treatment. Twenty patients with primary aldosteronism responded to spironolactone with reversion of the blood pressure to normal, but the frequency of such side-effects as gynaecomastia, decreased libido and impotence in the male, and menstrual irregularity and mammary discomfort in the female eventually led to

[1] Conn, J. W., *Journal of Laboratory and Clinical Medicine*, 1955, **45**, 3.
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[3] Laidlaw, J. C., Yendt, E. R., and Gornall, A. G., *Metabolism*, 1960, **9**, 612.
[4] Laragh, J. H., *Medical Clinics of North America*, 1961, **45**, 321.
[5] Liddle, G. W., *Annals of the New York Academy of Sciences*, 1966, **139**, 466.
[6] Wiebelhaus, V. D., Weinstock, J., Brennan, F. T., Sosnowski, G., and Larsen, T. J., *Federation Proceedings*, 1961, **20**, 409.
[7] Spark, R. F., and Melby, J. C., *Annals of Internal Medicine*, 1968, **69**, 685.
[8] Cranston, W. I., and Juel-Jensen, B. E., *Lancet*, 1962, **1**, 1161.
[9] Winer, B. M., Lubbe, W. F., and Colton, T., *Journal of the American Medical Association*, 1968, **204**, 775.
[10] New, M. I., and Petersen, R. E., *Journal of Clinical Endocrinology and Metabolism*, 1967, **27**, 300.
[11] George, J. M., Gillespie, L., and Bartter, F. C., *Annals of Internal Medicine*, 1968, **69**, 693.
[12] Ross, E. J., *Clinical Pharmacology and Therapeutics*, 1965, **6**, 65.
[13] Radó, J. P., Marosi, J., Takó, J., and Dévényi, I., *American Heart Journal*, 1968, **76**, 393.
[14] Sherlock, S., Senewiratne, B., Scott, A., and Walker, J. G., *Lancet*, 1966, **1**, 1049.

surgery being advised in all cases. In the patients with secondary hyperaldosteronism spironolactone produced little or no change in blood pressure. This finding accords with earlier reports[8 9] showing that some patients with essential hypertension may have a small fall in blood pressure when treated with either spironolactone or a benzothiadiazine or related diuretic. Thus it would seem that primary aldosteronism causing hypertension should be treated by surgery, or, when indicated, by glucocorticoid suppression.[10] The secondary aldosteronism found in malignant hypertension may disappear when the blood pressure is effectively controlled.[11]

But there is a place for spironolactone in the management of oedema. While the drug by itself is relatively ineffective, it may be useful in combination with another diuretic.[12] Used in this way it antagonizes the effect of the increased secretion of aldosterone that results from the sodium depletion and shrinkage of plasma volume induced by the primary diuretic, and it thereby inhibits the distal tubular reabsorption of the sodium whose proximal tubular reabsorption is blocked by the primary diuretic. In this way spironolactone may increase output of sodium and reduce output of potassium. Nevertheless, it may still be necessary on occasion to administer potassium supplements to prevent hypokalaemia. But this last addition to the diuretic regimen must be cautiously made when any renal failure is present, for in this situation even spironolactone alone may give rise to dangerous hyperkalaemia.[13] Care must also be taken in the administration of potent diuretics to patients with severe cirrhosis and ascites lest they precipitate death from hyponatraemia and azotaemia.[14]

Day Wetting in Boys

Anything which contributes to our understanding of disordered micturition in childhood is worthy of attention, for the prognosis and management of it pose difficult problems. The soiling of trousers and underclothes at an age when continence would normally be expected may occasion considerable inconvenience and embarrassment. In the absence of any clear-cut clinical abnormality this distressing behaviour is often ascribed to psychological causes or to defective family training. It may thus be consoling to both parents and sufferers to learn that the condition may in some cases have a concealed organic basis.

Recently J. Stuart Taylor[1] described three cases in which continued wetting by day appeared likely to have been due to congenital dilatation of the bladder neck and proximal urethra. All were boys in whom due allowance had been made for the delayed establishment of normal control, since they all presented at the age of 9 or 10. None showed any clinical abnormality or evidence of a neurogenic cause, and routine radiological examination disclosed nothing remarkable. Micturating cystography, however, revealed an unusual form of dilatation of the proximal urethra associated with a bladder of large volume and reflux into the ureters. The expansion of the urethra was unlike the comparatively short funnel-bladder neck commonly seen in neurogenic disorders, since it extended distally to beyond the region of the bulb and gradually tapered onwards from this point. The association with a bladder of large volume and ureteric reflux with a low voiding pressure suggested that the condition represented a primary neuromuscular defect akin to that of megacolon. Two of the patients were dry by night and wetted themselves only by day, while the third, who had gained complete control at the age of 3, had lapsed at the age of 7. It seems easy to understand from the radiological evidence of urethral dilatation how a little stress in the erect position might have led to incontinence. Fortunately a five-year follow-up on conservative treatment, in the expectation that the condition would improve spontaneously at puberty, was fully justified, and all three patients were subsequently reported as symptomatically better. It is suggested, however, that with the development of new methods of artificial electrical stimulation more active management may become appropriate in the future.

Although probably showing a comparatively rare cause of diurnal incontinence, these cases have undoubtedly enriched our knowledge of this problem. The condition described represents a further example of the discoveries which have recently been made by means of functional investigation of the genitourinary tract.

[1] Taylor, J. S., *British Journal of Urology*, 1969, **41**, 320.

Specific Drugs against Influenza

A sustained effort is being made to find one or more drugs which can be used in human influenza. Amantadine has some effect against influenza A when given prophylactically,[1] and the isoquinoline drug U.K.2371 prevented influenza in volunteers given certain strains of influenza A and B.

Further information is now available. At a recent meeting in New York a study was reported which had been carried out in collaboration between Geigy, Sheffield University, and the Royal College of General Practitioners.[2] Families in which a case of clinical influenza had occurred were selected, and the rest of the members were given placebo or 200 mg. daily of amantadine by mouth. The index patient and the rest of the family were observed clinically and tested for antibody response against influenza A2. It was found that 27 out of 69 persons given placebo developed laboratory-confirmed attacks of influenza, while 7 out of 48 persons on amantadine did so. This difference is highly significant statistically, and shows that the drug has a real and substantial effect when used in the conditions of family practice. On the other hand, it is usual to encounter the patient when he is sick rather than when he is exposed to infection. In earlier experiments amantadine was found to have no effect when given after the onset of symptoms, but the methyl derivative rimantadine has now been tested on men infected during an influenza outbreak in a prison in Iowa.[3] Nine patients were given placebo and nine were given the drug. Treatment was

[1] *British Medical Journal*, 1968, **3**, 137.
[2] Galbraith, A. W., Schild, G. C., Watson, G. I., and Oxford, J. S., paper presented at New York Academy of Sciences Second Conference on Antiviral Substances, 16–19 June 1969.
[3] Rabinovich, S., Baldini, J. T., and Bannister, R., *American Journal of the Medical Sciences*, 1969, **257**, 328.
[4] Reed, S. E., Beare, A. S., Bynoe, M. L., and Tyrrell, D. A. J., paper presented at New York Academy of Sciences Second Conference on Antiviral Substances, 16–19 June 1969.
[5] Meenan, P. M., and Hillary, I. B., paper presented at New York Academy of Sciences Second Conference on Antiviral Substances, 16–19 June 1969.
[6] Scientific Committee on Interferon, paper presented by A. J. Beale at New York Academy of Sciences Second Conference on Antiviral Substances, 16–19 June 1969.
[7] Kleinschmidt, W. J., paper presented at New York Academy of Sciences Second Conference on Antiviral Substances, 16–19 June 1969.