episode shows that speculation about risks of infection is no substitute for measuring the transmission occurring in practice.

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Desmopressin urine concentration test

Formerly intramuscular injection of vasopressin tannate in oil provided a useful and convenient means of assessing urine concentrating ability,[1] although it was a less potent stimulus than fluid deprivation.[2] Because vasopressin tannate in oil is now no longer manufactured another practical test of concentrating ability must be defined. We describe an investigation of the use of 1-diamino,8-D-arginine vasopressin, desmopressin (DDAVP, Ferring Pharmaceuticals Ltd), by intramuscular (IM) and intranasal (IN) administration to test urine concentrating ability in adults, firstly in an overnight test and then in a shorter day test using only IN desmopressin. The desmopressin day test is simpler and as useful as the conventional overnight vasopressin test.

Patients, methods, and results

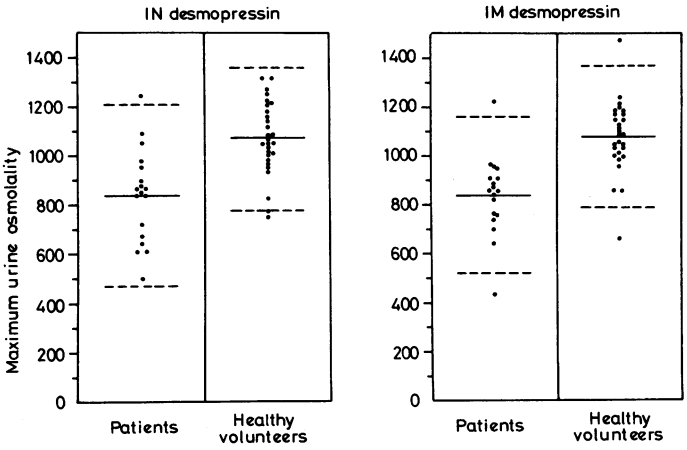
Overnight test—We studied 28 healthy students (aged 18-21) and 18 convalescent patients (aged 24-66) who had normal blood urea concentrations, neither proteinuria nor glycosuria, and who were not taking diuretics. Fluid was not restricted. We compared urine concentration after IN desmopressin (40 μg) and IM desmopressin (2 μg), using each individual as his own control. Desmopressin was given between 1630 and 1700; the osmolality of the last urine specimen passed before retiring to bed and the first two specimens thereafter was measured. For the maximum urine osmolality recorded for each individual (figure) the mean for students (IM 1080 mOsm/kg $\pm$ 148 SD; IN 1075 $\pm$ 148) was higher ($P < 0{\cdot}001$ by Student's t test) than for convalescent patients (IM 839 $\pm$ 164 SD; IN 838 $\pm$ 190) after each route of administration. No significant difference was found between the maximal response to IN and IM administration, although the response to IN was more rapid; one-half of the subjects reached a maximal concentration before retiring to bed, compared with one-third after IM injection.

Day test—A further eight healthy volunteers (aged 20-41) were given IN desmopressin (40 μg) at 0900 to determine whether the relative dehydration of the overnight test or the time of testing contributed to the result. The osmolality of the next two urine specimens passed was measured. The mean osmolality of the second specimen—that is, urine produced between five and nine hours after IN desmopressin—was 999 $\pm$ 68 SD mOsm/kg, a figure not significantly different from the mean maximum osmolality of students in the overnight test (1075 $\pm$ 148).

Comment

IN and IM desmopressin were equally effective; injection is therefore no longer a necessary part of urine concentration tests either in adults or in children.[3] The time of day was of no consequence. The osmolality of urine passed five to nine hours after desmopressin in the day test was similar to the maximum achieved overnight.

Convalescent patients took up to two hours longer to achieve maximal concentrations but in all cases the osmolality of the first specimen in the overnight test (five to nine hours after desmopressin) provided a close approximation of the maximum concentration that was reached—being either already over 800 mOsm/kg or within 100 mOsm/kg of the maximum eventually reached by that individual. Whether the lesser response of convalescent patients reflected age or general effects of illness is being studied separately.



Maximal urine concentration (mOsm/kg of water) of healthy individuals and convalescent patients after intramuscular (IM) and intranasal (IN) desmopressin in an overnight test. Mean response was higher ($P < 0{\cdot}001$) in healthy individuals; IM and IN desmopressin were equally effective.

Clinical tests of urine concentration are concerned with order of concentration rather than absolute maximum. It appears that most people with normal renal function can be expected to concentrate their urine above 700 mOsm/kg in the period five to nine hours after IN desmopressin (40 μg). Fluid restriction is unnecessary but excessive drinking during the test entails a risk of water intoxication.[4] Desmopressin has negligible vasopressor activity and does not evoke hypersensitivity reactions.[5]

Because the urine flow rate is greatly reduced after desmopressin we recommend that in the day test the bladder should be emptied at the time desmopressin is given. Hence if only one urine specimen is obtained in nine hours it will not have been diluted by urine in the bladder at the beginning of the test.

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Renal vein thrombosis, nephrotic syndrome, and focal lupus glomerulonephritis

The association of disseminated lupus erythematosus, nephrotic syndrome, and renal vein thrombosis has been reported in 10 cases.[1-5] In all five cases in which there were enough histological details[4 5] diffuse membranous glomerulonephritis was shown. It has therefore been suggested that this condition is probably similar to the idiopathic

nephrotic syndrome in that most patients with associated renal vein thrombosis have membranous glomerulonephritis.[5]

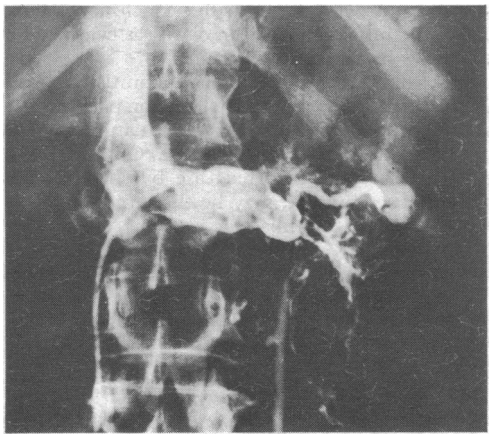
We describe here a patient who presented with lupus erythematosus, nephrotic syndrome, and unilateral renal vein thrombosis and was found to have another type of histological lesion: focal proliferative glomerulonephritis.

Case report

A 45-year-old woman admitted to our unit in February 1976 was found to have malar erythema, bilateral pleural effusion, and ankle oedema. Her blood pressure was 120/90 mm Hg. When she was 26 this woman had had proteinuria and oedema during the first trimester of her second pregnancy but had had no evidence of renal failure or hypertension. Delivery had been normal. Two years after this pregnancy she had begun to have pain in her joints, and five years before admission she had developed malar erythema and occasional fever.

Laboratory investigation showed: packed cell volume of 40%, white cell count $5{\cdot}1 \times 10^9$/l (5100/mm^3); erythrocyte sedimentation rate 48 mm in 1 h; platelet count $196 \cdot 10^9$/l (196 000/mm^3); urea 10 mmol/l (60 mg/100 ml); serum creatinine 150 μmol/l (1·7 mg/100 ml); creatinine clearance 44 ml/min/1·73 m^2; total protein 44 g/l; albumin 17 g/l; cholesterol 6·4 mmol/l (248 mg/100 ml); and triglycerides 3·0 mmol/l (268 mg/100 ml). Urine analysis showed proteinuria of 14 g/day with 15-20 red cells, 2 or 3 leucocytes, and 3 or 4 granular casts per high-power field. LE cells were found, and she was positive for antinuclear antibodies at a titre of 1/640. C3(B_1A) was 0·470 g/l (normal: 0·52-1·15 g/l) and plasma fibrinogen was 3·54 g/l, with no serum fibrinogen degradation products.

Chest radiographs showed bilateral pleural effusion. Bilateral renal phlebography showed complete occlusion of the left intrarenal venous system, with a large thrombus in the principal venous trunk and collateral drainage circulation throughout the ovarian vein (see figure). Biopsy of the left kidney showed that out of 25 glomeruli three were completely sclerosed, 13 were normal on light microscopy, and nine had proliferative segmental lesions with focal thickening of the basement membranes, areas of necrosis, and adhesions. There were mild tubulointerstitial lesions with lymphocyte accumulation, slight fibrosis, oedema, and tubular atrophy. Immunofluorescent deposits of IgG, IgM, C1q, and C3 were shown in the mesangium and basement membranes of almost all glomeruli. There were no deposits of IgA, IgE, C4, or fibrinogen.



Left renal phlebography showing complete occlusion of intrarenal venous system, thrombus in principal trunk, and collateral drainage circulation throughout ovarian vein.

The patient was treated with prednisone (40 mg/day) and azathioprine (100 mg/day). During the next two months renal function worsened, but after three-day pulse treatment with methylprednisolone 1 g/day it improved and she was discharged on oral prednisone (30 mg/day) and azathioprine (100 mg/day). During the next 11 months kidney function was sustained without hypertension and with a proteinuria of 4-6 g/day.

Comment

In all previous cases of lupus erythematosus associated with the nephrotic syndrome and renal vein thrombosis the histological appearances, when documented,[4 5] have shown membranous glomerulonephritis. Ours is the first case to show focal proliferative glomerulonephritis.

The pathogenesis of the triad remains obscure. Although the idiopathic nephrotic syndrome seems to be associated with a hypercoagulable state characterised by increased concentrations of factors V, VII, VIII, and X, fibrinogen, and platelets, the coagulation abnormalities in lupus erythematosus are complex. Thrombocytopenia is often found and almost half the patients have qualitative defects in the platelets, with a decrease in platelet aggregation induced by collagen, adenosine diphosphatase, and adrenaline. Circulating anticoagulants against clotting factors may be found, which seems to reduce the tendency toward thrombosis. On the other hand, lupus vasculitis favours peripheral vascular occlusions as well as superficial and deep vein thrombophlebitis, and an increase of fibrinolitic split products has been reported, which suggests that slow intravascular coagulation may occur.

To our knowledge there have been no controlled trials to determine whether renal vein thrombosis worsens the prognosis of patients with the lupus nephrotic syndrome. Prospective studies in which renal phlebography and biopsy are performed in patients with the lupus nephrotic syndrome are needed to establish whether renal vein thrombosis is associated more often with membranous nephropathy than with focal proliferative lesions and whether this has any prognostic significance.

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Aid for the disabled

The Vac-Pac system was originally conceived to maintain the patient in the correct position during surgery. It was later thought that this principle could easily be used in the conscious patient who through injury or disease was unable to maintain a comfortable resting position: in particular this might prove useful for patients with deformity or muscular weakness due to muscular dystrophy. Such patients often have great difficulty in sleeping owing to an inability to maintain a comfortable position.

Method

Vac-Pac consists of thousands of polystyrene beads within a plastic envelope which can be moulded to shape. When a vacuum is created within the envelope the beads clump together, becoming solid and maintaining their shape. The device reverts to its flat shape on releasing the vacuum. The vacuum required can easily be created by a small hand-operated vacuum pump such as the Ambu Minipump. The total cost is about £75.

Usually the child is brought into hospital for a few days so that both parents and child can familiarise themselves with the technique. With the patient in the desired position the Vac-Pac is moulded around the body contour and then suction applied (see figure). The Vac-Pac may be used lined or unlined.

Discussion

Most paediatric hospitals see the unfortunate sufferers of muscular dystrophy in either neurological or orthopaedic clinics. Vac-Pac has been found ideal for these patients, its particular advantage lying in its facility for altering shape as the patient grows or his deformities deteriorate. Thus the Vac-Pac can be used as an aid to sleep and also to maintain a comfortable sitting position during play.

The results of using this device have been extremely encouraging. To date, four patients aged between 9 and 16 years all with Duchenne type of muscular dystrophy have used this method. All reported