Diabetogenic effects of nifedipine

Nifedipine is widely used to treat angina pectoris and hypertension. Some studies of its effects on carbohydrate metabolism and insulin secretion have shown it to be potentially diabetogenic, although another study found that it had no appreciable effect on glucose tolerance. We report on one patient in whom diabetes deteriorated and another in whom it developed during the use of nifedipine; in both cases these effects disappeared after withdrawal of the drug. We have not been able to find any other such reports, and neither the adverse drug reaction monitoring team in Kuwait nor the manufacturers of nifedipine have been notified of such side effects.

Case reports

CASE 1

A 56 year old man was diagnosed as having diabetes mellitus in 1982. He had had hypertension and type IV hyperlipidaemia since 1969 and a myocardial infarction in 1978. His diabetes was controlled by diet and he was prescribed propranolol 320 mg/day, chlorothiazide 50 mg thrice weekly, isosorbide dinitrate 30 mg/day, and clofibrate 2 g/day. In August 1983 his fasting plasma glucose concentration was 7·9 mmol/l (142·4 mg/100 ml), and his nifedipine 30 mg/day was started to control his hypertension and mild angina. Ten days later he complained of fatigue and polyuria, and his fasting plasma glucose concentration was found to be 30·8 mmol/l (555 mg/100 ml). He was admitted to hospital, and insulin injections were started. Examination did not show any abnormality. His blood pressure was 120/80 mm Hg and his temperature normal. Blood tests showed: white cell count 7·5×10⁹/l, erythrocyte sedimentation rate 61 mm in the first hour, blood urea concentration 19 mmol/l (114 mg/100 ml), creatinine concentration 336 μmol/l (3·8 mg/100 ml), and normal serum electrolyte concentration. Urine and throat cultures were sterile.

Despite twice daily injections of insulin zinc suspension (Monotard) and neutral insulin (Actrapid), his plasma glucose concentrations during the day were 19·6-22·4 mmol/l (353-404 mg/100 ml) with no ketonuria. Three days later nifedipine was stopped. His plasma glucose concentrations fell gradually and the doses of insulin were tapered down. He was discharged, taking a small dose of insulin, when his fasting plasma glucose concentration was 8·2 mmol/l (148 mg/100 ml). During follow up insulin was withdrawn, and two months later his fasting plasma glucose concentration was 5·4 mmol/l (97 mg/100 ml) without any medication.

CASE 2

A 67 year old man, hypertensive since 1973 and taking propranolol 180 mg/day, and with a recent history of myocardial infarction in the same year, His fasting plasma glucose concentration was 5·5 mmol/l (99 mg/100 ml) in December 1982, and oral nifedipine 20 mg/day was started for angina. A month later he started to complain of polyuria, and his fasting plasma glucose concentration was 10·4 mmol/l (187 mg/100 ml). No cause could be found for this sudden development of diabetes mellitus. During the next few months his fasting plasma glucose concentration remained between 8·8 and 9·8 mmol/l (159 and 177 mg/100 ml). Nifedipine was stopped in November 1983 when his symptoms became worse. Three days later his fasting plasma glucose concentration was 5·2 mmol/l (94 mg/100 ml) and he stopped complaining of polyuria, although his angina worsened.

Comment

The administration of nifedipine to both patients was associated with raised plasma glucose concentrations, which returned to normal after this drug was withdrawn. We could not find any other factor in either patient to explain these changes. In view of reports that nifedipine may be diabetogenic, we conclude that it was responsible for the deterioration in glucose homeostasis in these two patients. Verapamil, another calcium antagonist, has been experimentally shown to inhibit the release of insulin. Although more studies are needed to confirm the effect of nifedipine on glucose tolerance, we suggest that plasma glucose concentrations should be monitored in diabetic and non-diabetic patients receiving this drug.

1. Ehren M, Lechner K, Mamoli B, Novotny C, VoK. Peripheral nerve lesions in haemophilia have only rarely been reported. Ehrman found that 37% of peripheral nerve lesions in his study showed only partial or no recovery. The rapid and complete clinical recovery shown in this case suggests that when intraneural haemorrhage is possible early surgical decompression with adequate factor VIII replacement is the treatment of choice.


Diabetogenic dislocation of the hip in mini rugby

Traumatic dislocation of the hip in children is rare and seldom presents to an individual surgeon. Most reports have combined the experience of several surgeons. We report two cases of traumatic dislocation of the hip incurred in mini rugby, both of which presented to the same orthopaedic surgeon within six months.

Case reports

Case 1—A 10 year old boy was kneeling, having been tackled, when he was knocked forwards on to his hands and knees by another player who then sat on his right buttock. The posterior dislocation thus caused was reduced with ease under general anaesthesia within a few hours. He then spent four weeks in skin traction, and the joint remained non-weight-bearing for a further two months, when he used crutches. His recovery was without complication: within eight months he had regained a full and painless range of movement of the hip and was back in the rugby team.

Case 2—A 10 year old boy was injured after scoring a try. He was on his hands and knees when another player jumped on his back, causing a posterior dislocation of the hip. Reduction was achieved with ease within three hours of injury. He was immobilised in fixed traction with a Thomas splint for four weeks, and the joint remained non-weight-bearing for a further two months, when he used crutches. Six months after the injury his hip was normal, both clinically and radiologically.

Comment

During games of mini rugby both these boys sustained a posterior dislocation of the hip without any associated fracture; neither showed any complication during the subsequent nine months. Posterior dislocation of the hip usually occurs when a force is directed proximally up the shaft of the femur from the knee to the flexed hip. This can happen in younger children who fall on to their knees or in older children who suffer greater trauma—for example, by falling from a height or in road traffic accidents. In our cases the knee was pressed to the ground and the dislocating force was applied to the pelvis via another player’s body weight. This mechanism of injury has been described previously in a child aged under 2 who was on his knees and elbows when his father fell on his back.

The major complications of traumatic dislocation of the hip include avascular necrosis of the femoral head, traumatic arthritis, coxa