

Initial serum electrolyte and blood gas values

Date and time	Sodium (mmol/l)	Potassium (mmol/l)	Chloride (mmol/l)	Carbon dioxide (mmol/l)	Urea (mmol/l)	Creatinine (μ mol/l)	Fractional inspired oxygen	Hydrogen (nmol/l)	Arterial partial pressure of carbon dioxide (kPa)	Base excess (mmol/l)	Arterial partial pressure of oxygen (kPa)	Glycine (μ mol/l) (normal 176-332)
Before operation	141	4.3	100	31	6.3	100						
17 Sept	1745	108*	6.8*	81*	18*	90*	0.4†	50†	5.6†	-5†	15.2†	5779
	2000	132	3.3	94	22	130	0.4†	50†	5.3†	-6†	10.8†	3471
	2400	134	3.9	100	23	110						1813
18 Sept	0800	136	3.7	102	26	100						415
	2000						0.21	38	5.5	+2	8.8	

*Haemolysed.

†Ventilated.

Conversion: SI to traditional units—Sodium, potassium, chloride: 1 mmol/l=1 mEq/l. Carbon dioxide: 1 mmol/l=4.4 mg/100 ml. Urea 1 mmol/l=6 mg/100 ml. Creatinine: 1 μ mol/l=0.01 mg/100 ml. Hydrogen: 1 nmol/l=1 pg/ml. Pressure of carbon dioxide: 1 kPa=7.5 mm Hg. Base excess: 1 mmol/l=1 mEq/l. Pressure of oxygen: 1 kPa=7.5 mm Hg. Glycine: 1 μ mol/l=0.08 μ g/ml.

(which avoids dissipation of diathermy currents in prostatic surgery) is unnecessary. An isosmotic electrolytic solution such as 0.9% saline may be substituted.² In the event of extravasation of this solution hyponatraemia and haemolysis would not occur and the slower rate of expansion of the intravascular space would be less of a challenge to the cardiovascular system.

In this case the infusion into the retroperitoneal space of a large volume of 1.5% glycine led to an increase in inflation pressure, an increase in intravascular volume with hypertension, and hyponatraemia and hyperkalaemia secondary to intravascular haemolysis. The signs and symptoms of acute hyponatraemia with water overload in the central nervous system (apprehension, restlessness, headache, nausea, vomiting, confusion, coma, convulsions, paralysis) are masked by general anaesthesia. Thus cardio-respiratory signs become important (severe hypertension, bradycardia, dyspnoea, cyanosis, increased amplitude of QRS complex, T wave inversion).^{3,4}

To avoid extravasation of large quantities of irrigant solution we suggest the use of low infusion pressures (60-70 cm H₂O) and measurement of the volume of irrigant going into and returning

from the patient. To reduce the effects of extravasation should it occur the use of 0.9% saline as irrigant solution is suggested and regional anaesthesia will allow detection of early changes in the central nervous system. With general anaesthesia raised inflation pressure suggests extravasation and, if suspected, emergency estimation of the plasma sodium concentration should be carried out.

We thank Mr R Scott for his permission to report this case.

References

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Prolonged use of nitrazepam for epilepsy in children with tuberous sclerosis

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Abstract

A case note study of 90 children with tuberous sclerosis showed that 56 had taken nitrazepam for seizures for from one month to 13 years. In 38 children nitrazepam was withdrawn but only two had immediate major seizures. Given that sleepiness, deterioration in motor skills, or ataxia seems to be associated in some children with treatment with nitrazepam, doctors may wish to review their long term prescriptions of this drug in children with tuberous sclerosis.

Introduction

Nitrazepam has been used since the 1960s to treat those myoclonic epilepsies of infancy and childhood that do not respond to general anticonvulsants.¹ Tolerance may develop within months, leading to increased doses over time.² No controlled study of this use of nitrazepam exists, and little attention has been paid to its possible side effects in small children.

Method and results

We made a case note study of 90 children with tuberous sclerosis attending hospital paediatric departments in Great Britain. The children were aged 5 or more at the time of the study.

Out of 86 children with seizures, 73 had had infantile spasms or childhood myoclonic epilepsy, or both. Fifty six had been given nitrazepam for from one month to 13 years. In 26 children seizures were moderated or stopped for at least a few months after nitrazepam was administered. No change in pattern or number of seizures was recorded for the 30 other children. The obvious consequence should therefore have been to stop giving the drug to these children. This was not necessarily the case.

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Nitrazepam was withdrawn in 38 children after a median of 1.1 years (range 0.1-8.1). Maximum doses for these children averaged 12 mg/day (range 2-50) for a median of 0.9 years (range 0.1-6.1).

The 18 other children were still taking nitrazepam at the time of the study—that is, for a median of eight years (range 1-13). Maximum doses averaged 18 mg/day (range 2-45) for a median of four years (range 0.5-9.5). The longer the children remained on the drug the higher the dose often became. No change in pattern or number of seizures had been recorded in nine of these 18 children after the administration of nitrazepam.

Only two of the 38 children in whom nitrazepam was withdrawn had major seizures immediately after withdrawal. No worsening of seizures was recorded in the others and some appeared to improve. Eight children were reported to become more alert when the drug was withdrawn. Among the 56 children who were prescribed nitrazepam 15 were reported to be sleepy while receiving the drug and 17 to have deterioration in motor skills or ataxia. Four children stopped walking for periods of time, and three became unable to sit.

About 60% of children with tuberous sclerosis are estimated to be retarded.³ Psychosocial development is affected more than gross motor skill and most learn to walk.⁴ We found highly significant associations between

No (%) of children with tuberous sclerosis and myoclonic epilepsy whose first seizure was before 3 months (n=21)

Factor concerned with epilepsy that might affect motor development	Children walking at 5 years (n=11)	Children not walking at 5 years (n=10)
Taking nitrazepam at 5 years	1 (9)	6 (67)*
Taking clonazepam at 5 years	—	—
Taking sodium valproate at 5 years	1 (9)	4 (40)
Taking carbamazepine at 5 years	2 (18)	3 (30)
Taking phenytoin at 5 years	6 (55)	2 (20)
Taking two anticonvulsant drugs or more at 5 years	7 (64)	4 (40)
Taking three anticonvulsant drugs or more at 5 years	—	1 (10)
Infantile spasms	10 (91)	9 (90)
Myoclonic epilepsy between 4 and 5 years	5 (45)	5 (50)
Severe epilepsy at 5 years (one or more seizures a day excluding simple absences)	6 (55)	6 (60)

* p=0.02; χ^2 exact.

the inability to walk at the age of 5 and both the early onset of seizures and treatment with nitrazepam. The table concerns the 21 children who had a first seizure before 3 months. Epilepsy factors were compared for those able to walk and those unable to walk aged 5. Significantly more of those unable to walk were taking nitrazepam. No other factor differentiated the groups.

Discussion

Our findings suggest that nitrazepam has side effects that may be prejudicial to the motor and cognitive development of some of these already handicapped children. Furthermore, there are children other than those with tuberous sclerosis who have taken nitrazepam in high doses for many years.

We are aware of the grave difficulties facing doctors who care for children with refractory myoclonic epilepsy. For many such children nitrazepam is undoubtedly effective in achieving initial control of seizures, and for some it seems to remain effective for some time. For others, however, its long term efficacy as an anticonvulsant drug is less clear. We hope that our findings will alert doctors to evaluate their practice of prescribing with regard to the long term use of this drug in such children.

We thank all the doctors who let us see their hospital records and the parents who allowed us to seek the information from the start.

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Normal variations in rate of albumin excretion and albumin to creatinine ratios in overnight and daytime urine collections in non-diabetic children

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Abstract

Urine albumin excretion measured over consecutive weekends and on repeated first morning collections from normal children showed considerable variation both during the day and from day to day in each subject. The results emphasise the need for repeated measurement of albumin excretion in children to confirm the presence of persistent microalbuminuria.

Introduction

Urine albumin excretion above normal but Albustix test negative (so called "microalbuminuria") may predict diabetic nephropathy.¹ Intermittent microalbuminuria may also occur in children from exercise and postural changes,² increasing the scatter of the reference range and the non-diabetic "false positive" rate. The use of timed overnight urine samples may reduce these potential errors.³

This study investigates the variations in daytime and overnight urine albumin excretion in individual non-diabetic children.

Subjects and methods

The 12 subjects studied (seven girls and five boys aged 5-17 years) were healthy children of members of staff. They voided immediately before going to bed, noting the time. Any night time urine was collected, as was the first morning sample, again noting the time, for 14 days. Every daytime urine sample over two weekends was also collected and its time noted, providing complete 48 hour collections for eight of the subjects. Each sample was weighed and frozen at -20°C.

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