consistently report that parents would prefer to be informed of the diagnosis as early as possible.

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Postoperative analgesia for circumcision

Local anaesthetics, often used to relieve pain after circumcision, are usually administered by caudal epidural injection¹ or by block of the dorsal nerves of the penis.² Both techniques are used in our hospital, and we compared the potentially less hazardous penile block with the caudal approach.

Patients, methods, and results

We studied 50 boys (mean age 4.5 (range 2-12) years) undergoing circumcision for medical indications as day patients. After admission they were interviewed with their parents by one of us (JW) and informed consent obtained. The patients were premedicated with oral diazepam 200 µg/kg, and anaesthesia was induced with thiopentone 5 mg/kg followed by nitrous oxide, oxygen, and halothane. They were randomly allocated to one of two groups to receive caudal or penile block immediately before surgery. In both groups 0.5% bupivacaine without adrenaline was used; for caudal block 0.5 ml/year of age was administered,¹ and penile block was achieved with 0.2 ml/kg, modifying the method described by Bacon.² Clean, no touch techniques were used.

A 23 gauge needle was inserted just below the lower border of the pubic arch and advanced midway between the arch and the root of the penis, piercing Buck's fascia. Two thirds of the analgesic was injected after aspiration to exclude puncture of blood vessels. After partial withdrawal of the needle the remaining one third was distributed subcutaneously on each side of the anterior aspect of the root of the penis to anaesthetise fibres arising from the genitofemoral and ilioinguinal nerves.

After operation (the mean duration of which was similar in each group)

Comparison of effects of caudal and penile blocks

	Caudal block (n = 23)	Penile block (n = 27)	p
Mean (SD) time to onset of pain (minutes)	766 (627)	727 (653)	NS
No of patients requiring papaveretum	5	3	
Quality of sleep:			
Good	13	12	} NS
Bad	10	15	
Paracetamol required*:			
Yes	13	13	} NS
No	5	11	

*Excludes those given supplemental analgesia in hospital.

analgesia was assessed continuously for five hours by the anaesthetist (JW) who had conducted the preoperative interview and induced anaesthesia; she had then left the anaesthetic room so that she did not know which type of analgesia had been used. Before the child left hospital his parents received a form for assessment of analgesia at home and some paracetamol.

The table shows the results. The time from administration of the block to first evidence of pain was assessed by the anaesthetist (in hospital) or parent (at home), the need for supplemental analgesia in hospital (papaveretum) by the anaesthetist, and the quality of the night's sleep and need for paracetamol after discharge by the parents. Statistical analysis was performed using a single tailed *t* test and χ^2 tests with Yates's correction.

We found no significant difference between caudal and penile block in the time to onset of postoperative pain, requirement of further analgesia in hospital or at home, or in quality of sleep on the night after operation.

Comment

Caudal analgesia provides better pain relief in the immediate postoperative period than morphine³ or buprenorphine administered at induction of anaesthesia.⁴ Penile block reduces the need for analgesics in the first 12 hours after surgery.⁵ Both techniques anaesthetise the prepuce—caudal analgesia by segmental block (sacral nerves 2, 3, 4) and penile block by blocking nerve conduction—although some fibres from the ilioinguinal and genitofemoral nerves may contribute to the innervation.

Serious complications may occur after caudal analgesia, though their incidence is low. These include sepsis, dural puncture, transient paralysis, and undetected puncture of blood vessels with ensuing haematoma, which may not be detected early when patients are treated on a day case basis. One of our patients suffered distressing weakness of the legs after caudal block despite the small volume of analgesic used. Two patients who received penile block had small haematomas at the base of the shaft of the penis.

Penile block during general anaesthesia for circumcision may be recommended as a simple procedure providing analgesia as reliably and effectively as caudal block and may be considered safer for day case surgery.

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Isosorbide dinitrate and isoxsuprine in exercise induced asthma

Pathogenesis of exercise induced asthma remains uncertain. Respiratory heat loss¹ is undoubtedly important. Whether it stimulates vagal receptors or causes degranulation of mast cells has not been established. Significant rises in neutrophil chemotactic factor and plasma histamine concentrations have been shown in response to exercise, suggesting that mediator release may be a factor.²

Beta agonists and sodium cromoglycate are effective inhibitors of exercise induced asthma but have effects on both the bronchial smooth muscle and the mast cells. We have studied the effects of the two smooth muscle relaxants isoxsuprine and isosorbide dinitrate given by inhalation as compared with sodium cromoglycate and salbutamol.

Effect of inhaled saline, sodium cromoglycate, salbutamol, isoxsuprine, and isosorbide dinitrate on exercise induced fall in forced expiratory volume in one second (FEV₁) in seven patients. (Data before and after expressed as absolute values (l) and postexercise change as percentage)

	Baseline FEV ₁ in l (SEM)		Maximal percentage fall in FEV ₁ * (SEM)		p
	Before	After			
(n = 6)					
Saline	2.99 (0.40)	2.95 (0.39)	31 (4.7)	Saline v isoxsuprine	0.01
Salbutamol	3.01 (0.51)	3.69 (0.45)	3 (2.2)	Saline v sodium cromoglycate	0.01
Sodium cromoglycate	3.15 (0.49)	3.26 (0.51)	8 (4.7)	Saline v salbutamol	0.001
Isoxsuprine	3.29 (0.33)	3.41 (0.43)	15 (9.4)	Isoxsuprine v sodium cromoglycate	0.2 (NS)
				Isoxsuprine v salbutamol	0.05
				Salbutamol v sodium cromoglycate	0.01
(n = 7)					
Saline	3.13 (0.34)	3.08 (0.45)	36.9 (4.9)	Saline v isosorbide	0.05
Salbutamol	3.11 (0.46)	3.65 (0.50)	4.3 (1.3)	Saline v sodium cromoglycate	0.05
Sodium cromoglycate	3.29 (0.54)	3.29 (0.58)	15.1 (8.13)	Saline v salbutamol	0.001
Isosorbide	3.44 (0.54)	3.19 (0.49)	20.5 (5.16)	Salbutamol v sodium cromoglycate	0.005
				Salbutamol v isosorbide	0.01
				Isosorbide v sodium cromoglycate	0.2 (NS)

*Maximal changes in FEV₁ calculated from postdrug baseline.

Patients, methods, and results

We studied seven patients aged 14-49 years with extrinsic and reproducible exercise induced asthma. Patients taking oral or aerosol corticosteroids, antihistamines, and anticholinergic drugs were excluded. Sodium cromoglycate and bronchodilator drugs were discontinued for 24 hours before each test. Forced expiratory volume in one second (FEV₁) was recorded on a water sealed spirometer (Godart Pulmotest). Exercise test consisted in steady state running on a treadmill at submaximal work loads for up to eight minutes under controlled conditions of temperature and humidity. The study was carried out in a random single blind fashion using saline (9 g/l), sodium cromoglycate nebuliser solution (10 g/l), salbutamol nebuliser solution (5 g/l), isosorbide dinitrate (10 g/l), and isoxsuprine (5 g/l). The drugs were delivered through a Wright nebuliser driven by compressed air at 10 l/min at tidal breathing for five minutes. The estimated doses of sodium cromoglycate, salbutamol, isosorbide dinitrate, and isoxsuprine nebulised were 12 mg, 6 mg, 12 mg, and 6 mg, respectively. Spirometry was repeated at 30 minutes after inhalation, then at 2, 5, 10, 15, and 30 minutes after exercise. The results of the tests were expressed as maximal percentage fall in FEV₁ from the postdrug baseline and analysed with Student's paired *t* test.

The effects of saline, salbutamol, sodium cromoglycate, and isoxsuprine were studied in six patients and the effects of saline, salbutamol, sodium cromoglycate, and isosorbide dinitrate in seven (table). The mean baseline FEV₁ before drug inhalation was comparable on all days of exercise testing and no significant difference was noted. Saline, sodium cromoglycate, isoxsuprine, and isosorbide dinitrate also did not affect the mean baseline FEV₁ significantly. As expected, salbutamol had a significant bronchodilator effect (*p* < 0.001). In six patients the maximal mean percentage falls in FEV₁ (SEM) after saline, salbutamol, sodium cromoglycate, and isoxsuprine were 31 (4.7)%, 3 (2.2)%, 8 (4.7)%, and 15 (9.4)%, respectively. The preventive effect of sodium cromoglycate and isoxsuprine was significant and no difference was noted between the two treatments. Salbutamol afforded the greatest protection of all treatments. The difference between salbutamol and sodium cromoglycate and between salbutamol and isoxsuprine was also significant.

In seven patients the maximal mean percentage falls in FEV₁ (SEM) after saline, salbutamol, sodium cromoglycate, and isosorbide dinitrate were 36.9 (4.9)%, 4.3 (1.3)%, 15.1 (8.1)%, and 20.5 (5.2)%, respectively. The preventive effect of sodium cromoglycate and isosorbide dinitrate was significant and no difference was noted between the two treatments. Salbutamol again offered the greatest protection of all treatments. The difference between salbutamol and sodium cromoglycate and between salbutamol and isosorbide dinitrate was also significant.

Comment

Isosorbide dinitrate and isoxsuprine given by inhalation afforded significant protection against exercise induced asthma in the patients studied, the beneficial effect being statistically comparable to that given by sodium cromoglycate. Salbutamol was, however, more effective in inhibiting exercise induced bronchoconstriction compared with sodium cromoglycate, isoxsuprine, and isosorbide dinitrate.

Isosorbide dinitrate and isoxsuprine are potent vasodilators³⁻⁵; isosorbide dinitrate acts directly on the bronchial smooth muscle, causing relaxation, whereas isoxsuprine is primarily an alpha blocking agent but with some weak inherent beta agonistic activity. Any action they are likely to have on mast cell membranes is probably minimal and the failure to observe bronchodilation after inhaling these drugs implies that at the dose used they do not relax human bronchial smooth muscle. Our observations imply that the protection afforded in exercise induced asthma is a result of inhibition of the bronchoconstrictor response produced by airways cooling or mediator release or both.

In conclusion, therefore, drugs which act purely on the bronchial

smooth muscle may modify exercise induced asthma, showing that it is important to be sure of the exact site of action of pharmacological agents before making assumptions about the mechanisms of exercise asthma from pharmacological experiments. Finally, our study suggests that isosorbide dinitrate would be a safe and indeed an effective preparation in patients with both chronic obstructive airways disease and ischaemic heart disease.

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Dysphagia: a further symptom of hypercalcaemia?

Carcinoma of the bronchus can produce dysphagia by direct compression of the oesophagus or by pressure from enlarged mediastinal lymph nodes. We report on two cases of bronchial carcinoma in which dysphagia was the predominant symptom and investigation failed to show any obstruction. Both patients, however, were found to have appreciable hypercalcaemia, and correction of this resulted in a rapid return of normal swallowing.

Case reports

Case 1—A 61 year old man developed pain in his right lateral ribs and total dysphagia for solids 10 months after a right upper lobectomy for a squamous carcinoma of the bronchus. A chest x ray film showed an opacity in the right upper zone with destruction of the right fifth and sixth ribs, but barium swallow showed a normal oesophagus with normal peristaltic waves and no evidence of obstruction. Biochemical profile was normal apart from a raised serum calcium concentration of 3.5 mmol/l (14 mg/100 ml) (normal 2.1-2.65 mmol/l (8-11 mg/100 ml)) and raised alkaline phosphatase activity of 163 IU/l (normal 28-128 IU/l). He was treated with high dose corticosteroids and intravenous fluids; his swallowing improved dramatically and had returned to normal within three days. He was given a short course of radiotherapy to the recurrent tumour but subsequently developed wide-