Hospitals responding to questionnaire that had an acute pain service by region

Region	No (%) of hospitals
East Anglia	5 (62)
Mersey	3 (37)
North East Thames	9 (45)
North West Thames	8 (44)
North West	7 (50)
Northern	5 (35)
Oxford	5 (62)
South East Thames	5 (33)
South West Thames	6 (50)
South West	7 (58)
Trent	4 (28)
West Midlands	5 (28)
Wessex	4 (44)
Yorkshire	7 (50)
Wales	6 (43)
Scotland	7 (41)
Northern Ireland	4 (67)

only 18 hospitals and the relative rarity of specific "pain nurses" and dedicated medical sessions gives concern as to the permanence of these services. *Pain, Discomfort and Palliative Care*, a Welsh Health Planning Forum document, gives clear advice and targets for both the purchaser and the provider—including the establishment of an acute pain service in all hospitals in Wales by 1995.[4] However, at the time of this survey, fewer than 50% of responding units in Wales had achieved this.

Although patient controlled analgesia and epidural opioid administration were available in most units, in many units such techniques were seldom used. Intermittent intramuscular injection of opioid is still widely used in a large number of hospitals. This may not necessarily be detrimental; good levels of analgesia can be achieved, as has been shown by Gould *et al.*[5]

It is to be hoped that an increasing number of hospitals will establish acute pain services. To this end, continued pressure should be placed on the purchaser to demand optimal acute pain management from their provider units—and be prepared to pay for it.

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Conflict of interest: None.

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Pulmonary oedema and haemoptysis induced by strenuous swimming

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Pulmonary haemorrhage induced by exercise is well known in racehorses.[1] Recent studies attribute the phenomenon to rupture of pulmonary capillaries because of a large increase in pulmonary blood flow and pressure.[2] Pulmonary oedema has previously been described in scuba divers and swimmers who have been immersed in very cold water, albeit without excessive exertion.[3] We report on a group of highly trained swimmers in whom severe dyspnoea and haemoptysis developed during the first 45 minutes of strenuous swimming in temperate Mediterranean waters.

Patients, methods, and results

Thirty young men on a military fitness training programme were engaged in a swimming time trial over 2·4 km in the open sea. The sea was calm and the measured water temperature 23°C. They swam in the supine position wearing only a bathing suit and using fins. Because of the high heat load expected, the swimmers had been instructed to drink large quantities of water before the swim, to avoid becoming dehydrated. They each drank about five litres of water during the two hours preceding the exercise.

Pronounced shortness of breath developed within 45 minutes in eight of the subjects, forcing five of them to terminate the swim prematurely. Since dyspnoea persisted, they were examined in the clinic at the training facility 30-60 minutes after the drill, and oxygen saturation was measured using a pulse oximeter. Those in more severe distress were given 20 mg intravenous frusemide and all were transferred, receiving oxygen by mask, to a local hospital. The patients' findings and the results of the laboratory investigation carried out in the emergency department are shown in the table. None had abnormal cardiovascular signs or hypertension. Their symptoms and signs resolved spontaneously during an overnight stay in hospital. All eight returned to similar activities and completed the training programme, apart from two (cases 5 and 7) who had recurrent episodes of pulmonary oedema or haemoptysis, or both, when they swam.

Summary of patients' characteristics and laboratory results

	Case No							
	1	2	3	4	5	6	7	8
Age (years)	18	18	19	18	18	19	18	18
In clinic at training facility:								
Cough	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Haemoptysis:								
Complained of	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observed	No	No	No	Yes	Yes	No	No	No
Oxygen saturation (%)	95	90	98	84	81	88	87	96
In emergency department:								
Partial pressure (mm Hg)								
Oxygen	84	82	85	66	62	77	82	85
Carbon dioxide	38	36	39	39	37	40	37	38
pH	7·42	7·38	7·45	7·38	7·41	7·39	7·41	7·37
Infiltrates in chest x ray film	Yes	No	No	No	No	No	Yes	No
Recurrent episodes	No	No	No	No	Yes	No	Yes	No

Comment

We surmise that three precipitating factors combined to produce a transient increase in the pulmonary capillary pressure: maximal exertion, immersion, and overhydration. Exercise causes an increase in cardiac output to meet the tissues' increased demand for oxygen. However, the increase in cardiac output will by itself rarely if ever raise pulmonary capillary pressure to the point of rupture in humans; pulmonary oedema and haemoptysis have never been reported even in top Olympic athletes with above normal cardiac performance. Immersion causes central blood pooling, thus increasing cardiac preload.[4] Water overload, the result of well intentioned but overzealous concern about dehydration, probably further increased pulmonary vascular pressure.

Haemoptysis and pulmonary oedema recurred in two of the patients without an increased fluid intake; recurrences gradually became less severe, gradually proceeding to complete spontaneous resolution. They may have been the result of residual damage to the alveolar-capillary unit, which finally healed.

Pulmonary oedema associated with immersion has previously been described in 11 divers and swimmers exposed to cold water.[3] Although the subjects did not engage in heavy exercise and their water balance was

probably normal, increased vascular reactivity was shown by high resting peripheral vascular resistance and a reduced response in a cold pressor test. Vasoconstriction, induced by cold that led to an increase in cardiac preload and afterload, combined with augmentation of cardiac preload associated with immersion was thought to explain the development of pulmonary oedema.[3] We suggest that the simultaneous occurrence of contributing factors is required for the development of pulmonary haemoptysis and oedema associated with immersion: cold induced vasoconstriction, as previously reported,[3] or the combination of exercise and fluid overload as in our cases.

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Trends in prescriptions of paracetamol for children

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In 1979 the *BMJ* focused attention on the harmful effects of medicines sweetened with sugar on children's teeth.[1] From 1984 the *British National Formulary* has included a warning, "although liquid preparations are particularly suitable for children, many contain sugar which encourages tooth decay. Sugar-free preparations should be used whenever possible." In 1986 the *British National Formulary* marked preparations which did not contain sucrose, glucose, or fructose as "sugar free." Pharmaceutical companies have responded to professional and market forces and are producing sugar free medicines.[2] However, availability does not necessarily mean that the medicines will be widely used and recommended.

The most commonly prescribed paediatric medicine is paracetamol. Sugar containing and sugar free generic and brand named versions which have identical therapeutic actions have been available for years. We investigated trends in prescribing by general practitioners in four health districts.

Methods and results

Permission was obtained from the North West Regional Health Authority to view combined district prescribing analysis and cost data for the districts of Oldham, Rochdale, Bury, and Bolton for April to June 1991, 1992, and 1993. The total volume of paracetamol prescribed was determined and the proportions that were sugar free and generic calculated. The χ^2 test was used to determine the differences in proportions between 1991 and 1993.

The table shows the proportions of sugar free and generic paracetamol prescribed in the four districts. In all four districts there was an increase in the proportion of sugar free prescriptions between 1991 and 1993 ($P<0.001$). In Oldham and Bolton the increase was over 10%. In 1991 overall, 29% of paediatric medicines were sugar free (95% confidence interval 17% to 41%). This had risen to 37% (31% to 44%) by 1993. Over the four districts generic prescriptions accounted for 19% (5% to 34%) in 1991 and 24% (16% to 33%) in 1993; fewer than 4% of these were sugar free.

Aggregated prescribing analysis and cost data for four districts April to June 1991, 1992, and 1993. Results expressed as percentage of sugar free paracetamol, percentage of generic paracetamol, and total number of 100 ml units prescribed

	1991			1992			1993		
District	% Sugar free	% Generic	Total No	% Sugar free	% Generic	Total No	% Sugar free	% Generic	Total No
Oldham	27	28	10 446	40	22	9 460	38	26	10 166
Rochdale	33	7	11 289	36	13	10 105	40	17	10 780
Bury	37	18	6 543	43	24	6 005	41	30	6 397
Bolton	20	24	9 949	29	22	9 023	32	26	10 636
Overall mean (95% confidence interval)	29 (17 to 41)	19 (5 to 34)		36 (27 to 47)	20 (12 to 28)		37 (31 to 44)	24 (16 to 33)	

Comment

Paracetamol is an excellent example of a medicine that is commonly prescribed, over 70% of prescriptions being for branded products. Of the 37% of sugar free prescriptions in 1993, most were brand name products. Efforts have been made to encourage generic prescribing, and though a generic sugar free version is available, it is rarely prescribed. This suggests that as generic prescribing becomes more prevalent the use of sugar free paracetamol may decline unless specifically encouraged.

A study of doctors' prescribing habits for children suggested that the main reason for not prescribing sugar free was that doctors had simply not thought about the issue and automatically prescribed whatever they were accustomed to using.[3] Others thought that it was not important in relation to all the other sugar intakes children have.

Decayed teeth may seem a minor problem, but a great deal of misery and pain can accompany tooth decay and many young children still require general anaesthesia for extractions. Fluoride in water and toothpaste helps but controlling the diet is also important, as the frequency of sugar consumption overwhelms the protective benefit of fluoride.

The more frequent the sugar intake, the more likelihood there is of decay developing. Young children are often given medicines just before bedtime or during the night. This is particularly damaging to teeth because saliva flow is reduced, buffering of the acids produced by sugar will be compromised, and demineralisation of tooth enamel will be greater, expediting decay.

A simple change to a sugar free medicine would have the same therapeutic effect and yet not pose a risk to children's dental health.

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