the first 14 days of life. Denominator data were taken from the national child health computer system.

From 1 September 1992 to 25 February 1993, 1170 live babies were born to the residents of Solihull Health District or had moved into the district in their first 14 days of life. The table shows the prevalence of jaundice by age. At the primary visit 175 babies were thought to be jaundiced. Only 78 babies had yellow eyes. Stool was seen in seven cases, urine in 10, both in nine, and neither in 119; the report was incomplete in 30. Dark urine was reported by the parents in three cases, one baby also having pale stools; pale stool was reported by the parents in three and by a health visitor in one. All these babies were well and free of jaundice at 6 weeks.

Seven babies were still jaundiced at 6 weeks, six of whom were breast fed. At 1 year the bottle fed baby had mildly raised transaminase activities and one baby was found to be heterozygous for α antitrypsin deficiency, but none had clinically significant liver disease.

Comment

Although 175 babies were reported as being clinically jaundiced at the primary visit, only 78 had yellow eyes, suggesting that visual screening for hyperbilirubinaemia may yield many false positive results. The prevalence of persistent jaundice was higher than might have been predicted.[4] This increase may be due to differences in the prevalence of breast feeding (58% of the mothers breast fed) or a genuine secular trend—others have noted an increase in the prevalence of neonatal jaundice.[5] We found prolonged neonatal jaundice to be commoner in boys, as reported previously,[5] which may be owing to a difference in maturity of hepatic bilirubin conjugation.

Defining clinical jaundice as yellow would lead to around 15% of babies requiring blood and urine sampling, representing a major impact on workload for health visitors, laboratories, and medical staff. Further investigation is needed to determine the cost-benefit characteristics of the suggested screening programme and other strategies.

We thank the health visitors of Solihull Healthcare NHS Trust for their help in collecting the data.

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Ability of hospital doctors to calculate drug doses

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See editorial

The contents of most drug ampoules are given as their mass concentration (mg or μg/ml), but a few drugs are traditionally given as a dilution or percentage concentration—for example, 1:1000 or 1% respectively. Many drugs used in resuscitation and acute medical emergencies are labelled in this way—for example, adrenaline 1:1000 and sodium bicarbonate 8·4% solution.

A survey showed that many junior doctors could not calculate the mass of lignocaine in ampoules of different concentrations.[1] We investigated further the ability of hospital doctors to convert between mass concentrations, dilutions, and percentage concentrations. We also asked which convention they preferred and the adequacy of their teaching on calculating drug doses.

Answers to questions on drug doses. Values are numbers (percentages) of hospital doctors

Question	Right		Wrong		Don't know	
1 How much noradrenaline (in mg) is there in 4 ml of a 1:1000 solution?:						
All doctors (n=150)		76 (51)		37 (24·5)		37 (24.5)
Physicians (n=51)	22 (43)		14 (27)		15 (30)	
Surgeons (n=70)	26 (37)		22 (31·5)		22 (31·5)	
Anaesthetists (n=29)	28 (97)		1 (3)		0	
2 How many mg of lignocaine are there in a 10 ml ampoule of lignocaine 1%?:						
All doctors (n=150)		68 (45)		49 (33)		33 (22)
Physicians (n=51)	20 (39)		16 (31)		15 (30)	
Surgeons (n=70)	19 (27)		33 (47)		18 (26)	
Anaesthetists (n=29)	29 (100)		0		0	
3 How many mmol of sodium bicarbonate are there in 100 ml of an 8·4% solution?:						
All doctors (n=150)		50 (33)		40 (27)		60 (40)
Physicians (n=51)	17 (33)		12 (24)		22 (43)	
Surgeons (n=70)	8 (11)		26 (37)		36 (51)	
Anaesthetists (n=29)	25 (86)		2 (7)		2 (7)	
4 How many mg of adrenaline are there in a 10 ml ampoule of 0·25% bupivacaine with adrenaline in a 1:200 000 solution?:						
All doctors (n=150)		46 (31)		39 (26)		65 (43)
Physicians (n=51)	8 (16)		13 (25)		30 (59)	
Surgeons (n=70)	16 (23)		19 (27)		35 (50)	
Anaesthetists (n=29)	22 (76)		7 (24)		0	
5 How many ml of a 1:10 000 solution would you need to obtain 1 mg of adrenaline?:						
All doctors (n=150)		92 (61)		19 (13)		39 (26)
Physicians (n=51)	32 (63)		5 (10)		14 (27)	
Surgeons (n=70)	31 (44)		14 (20)		25 (36)	
Anaesthetists (n=29)	29 (100)		0		0	

Subjects, methods, and results

We asked 150 teaching hospital doctors of all grades and from a representative spread of the major specialties to complete a written questionnaire comprising five questions about drug dilution and concentration (see table). One of us (SR) was present while the form was completed. Ten minutes was allowed. Unanswered questions were classified as "don't know" answers.

Completed forms were received from all doctors. The table shows the results. Questions 3 and 4 were the most difficult, having been answered correctly by only around a third of doctors. Proportionally more consultants and senior registrars than doctors in junior grades answered these questions correctly—for example, 58% (11/19) of consultants but only 4% (1/24) of preregistration house officers answered question 3 correctly.

Over two thirds of doctors (117) said that they would prefer ampoules to be labelled with the mass concentration rather than the dilution or percentage concentration. Thirteen expressed no preference, and nine thought that two conventions should be used. Of the 11 doctors who were satisfied with the current labelling arrangements, six were unable to answer any of the questions correctly and only two gave five correct answers.

Forty two doctors considered that they had received adequate teaching on calculating doses, but only 19 answered all the questions correctly.

Comment

Around half the doctors surveyed were unable to convert drug doses correctly from a percentage concentration or dilution to the more conventional mass concentration. Replies varied by as many as three orders of magnitude.

Those who correctly answered question 1 would be expected also to answer question 5 correctly since these questions are closely related: only 33 doctors gave answers that did not correlate. Twenty one of them could give the correct clinical dose of adrenaline (question 5); this might have been learnt by rote.

Many doctors thought that there was no need to be able to convert from one convention to another. One reason often cited was that the commonly available commercially packaged syringes of adrenaline and lignocaine for use in medical emergencies contain the appropriate dose. Many surgeons commented that they knew the safe maximum volume of a given lignocaine solution rather than its mass concentration, but this belief was not supported by previous findings.[1]

Drug doses recommended in resuscitation protocols are confusing. The European Resuscitation Council's guidelines stipulate doses of adrenaline and sodium bicarbonate in mg and mmol.[2] Our results suggest that many doctors have little idea of what volume of drug is required when it is presented in commonly available ampoules.

In March 1991 the National Pharmaceutical Supply Group accepted a proposal for an NHS specification for ampoule labels.[3] Initially the document specifies that units should be SI and "the amount/concentration [be] expressed as the amount 'x' or the concentration 'x' in 'y' ml, where 'y' is the total volume of the ampoule." The document later states, however, that when products (specifically local anaesthetic drugs) have been traditionally measured in another way they should continue to be measured that way. The *European Drug Index* also shows the coexistence of several conventions: adrenaline is listed as a dilution, mass concentration, and percentage concentration depending on the country in which it is used.

Our results suggest that all drugs, especially those used in medical emergencies, should be measured in a standard way, as a mass concentration, to avoid potentially hazardous confusion.

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3 National Pharmaceutical Supply Group. *Ampoule labels: NHS specification* London: HMSO, 1994.
4 Muller NF, Dessing RP, eds. *European drug index.* 2nd ed. Stuttgart: Deutscher Apotheke Verlag, 1992.

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Correction

Safety and efficacy of combined meningococcal and typhoid vaccine

An authors' error occurred in this short report by Dr S H Koo and others (8 April, pp 908-9). In the table the mean geometric (range) antibody titre to typhoid Vi antigen at 3-6 weeks in group C should have read 1·7 (0·3-45·0) mg/l, not 3·7 (0·3-45·0) mg/l as published. The statistics and conclusions remain the same as this was simply a typographical error.

A MEMORABLE PATIENT

A disarming consultation

It was my second shift in casualty. The first had not been as bad as expected. I had just about mastered the computer enough to order an *x* ray examination and was rather pleased with my sutures to a lacerated arm. This evening had been quiet; I had finished work in "minors" by midnight and I went to the "major" side to see if I could help out.

A staff nurse, looking rather hesitant, said, "I don't think you should see this one, he is best left to a male doctor. He is a homicidal, suicidal, HIV positive drug addict who needs help. And he's carrying a garrotte."

"I'm certainly not going to see him!" said my male colleague retreating across the department.

I thought that things could not be as bad as they sounded and offered to see the patient. The staff nurse suggested that she came with me.

In the cubicle was a young, tired looking man in a black leather jacket sitting propped up against the examination couch. I introduced myself with a smile and a handshake and settled in the chair next to him, adopting my best psychotherapist pose. Phillip said that he had been on heroin for a long time and that he had also been in the Foreign Legion. His mind was completely tangled by the drugs he was taking and he was terrified that he might take not only his own life, but, worse, someone else's. "I know how to kill," he said.

As we talked he drew a long thick wire out of his jacket with large metal rings at each end big enough to fit a finger. As he twanged it between his fingers, I moved back in my seat horrified. He looked up and seemed upset. "I'm really scaring you, but I don't want to." "Why don't you put that down on the bed," I said, taking the garrotte from him and gingerly covering it with a pillow.

As I tried to continue the conversation, Phillip, still deeply involved with his murderous thoughts, reached into his jacket and drew out a large hunting knife with a 20 cm blade. "I've also got this," he said. Rather than heading for the door, I heard myself asking him to put the knife under the pillow with the garrotte.

Then, with some presentiment, I said, leaning forward, "Have you got anything else hidden inside your jacket?" He looked deeply ashamed. "Yes, a syringe full of HIV positive blood. I've thought about stabbing people with it." He opened his jacket and I could see the white plunger of an insulin syringe. "Can I take that?" I asked and he nodded. I reached inside his jacket, carefully removed the syringe, and took it outside to the nearest sharps bin.

I returned and standing at the end of the couch I gestured towards the pillow. "Phillip, you don't really want these things do you?" He shook his head. I took his casualty card and, placing the garrotte and knife between the pages to conceal them, took them outside and handed the parcel to the nearest nurse. I returned to Phillip.

We spoke together for several more minutes and he agreed to see the duty psychiatrist. He also welcomed a cup of coffee and I welcomed this cue to leave. I calmly followed the staff nurse out of the door until I saw the six policemen. Then my knees wobbled and my head began to spin.

Phillip was seen by the duty psychiatrist and he was referred as an outpatient to a clinic dealing with HIV related stress. The police did not arrest him because he had given up his weapons voluntarily and, therefore, had not committed a crime.—VERONICA WHITE *is a senior house officer in medicine in London*