Their prohibitive cost is beyond the means of most small health centres and virtually all households (current price £685.91 including VAT for the Model 20 Egnell electric breast pump; Eschmann Bros and Walsh Ltd, Sussex). Yet it is in poorer communities that the potential need for such devices may be greatest.

The Bristol breast pump is simple both in design and in operation and should cost well under £15 if mass produced. It is easily sterilised and requires no maintenance. It affords the mother the freedom to select a comfortable suction pressure and to express milk at her own rate. Such a pump may provide a means for initiating, maintaining, or extending the lactational period in mothers who might otherwise resort to artificial infant formulas.

I thank the staff on ward 76 of Bristol Maternity Hospital, Mr R T Batchen for his indispensable glassblowing skills, Dr V M Sponcel for testing prototypes, and Gary M James for the illustration.

This work has been supported by La Leche League International.

¹ Vorherr H. Human lactation and breast feeding. In: *Lactation: a comprehensive treatise*. Vol 4. New York: Academic Press, 1978.

² Cunningham A. Morbidity in breast-fed and artificially fed infants. *J Pediatr* 1979;**95**:685-9.

³ Welsh J, May J. Anti-infective properties of breast milk. *J Pediatr* 1979;**94**:1-9.

⁴ Klaus M, Kennel J. *Maternal infant bonding*. St Louis: C V Mosby Co, 1976.

⁵ Gallenkamp. *Scientific catalogue 1980*. London: Gallenkamp, 1980:562-3.

(Accepted 17 January 1983)

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Evidence that disopyramide does not interact with warfarin

Haworth and Burroughs reported that disopyramide interacts with warfarin.¹ Their observation was based on a single case where disopyramide was discontinued in a hypotensive patient because of its potential negative inotropic effect. A good clinical response occurred over 24 hours followed by a decreasing prothrombin time requiring incremental doses of warfarin. They concluded that the apparent interaction between disopyramide and warfarin might be a competitive phenomenon at the receptor site. Our findings refute their evidence.

Present study and results

We studied the doses of dicoumarol or warfarin in seven patients before and after conversion of atrial fibrillation (table). Two of the patients received dicoumarol and five warfarin. Quinidine sulphate was given to four of the patients (400 mg thrice daily) as an antiarrhythmic agent, while three—all receiving warfarin—were given disopyramide (200 mg thrice daily). With this treatment some patients regained sinus rhythm, and in the others sinus rhythm was regained after DC conversion. All except one of the patients needed a small increase in the weekly anticoagulant dose; the remaining patient had an increase in thrombotest value (table). (The dose was expressed as the mean number of tablets used weekly during five weeks before or five weeks after conversion. The dosage of oral anticoagulant drug was prescribed so that the thrombotest value was within therapeutic limits.)

Anticoagulant treatment before and after DC conversion of atrial fibrillation (dose given as mean weekly number of tablets (dicoumarol 50 mg, warfarin 2.5 mg)), mean weekly thrombotest result (%), and antiarrhythmic treatment

Case No	Age (years)	Anticoagulant	Mean weekly dose (No of tablets)		Mean weekly thrombotest result (%)			Antiarrhythmic treatment
			Before	p < 0.01 After	Before	NS	After	
1	62	Dicoumarol	6.0	7.0	10 ± 5		10 ± 4	Quinidine
2	67	Dicoumarol	10.5	13.0	10 ± 2		10 ± 2	Quinidine
3	49	Warfarin	10.5	12.0	7 ± 3		13 ± 4	Quinidine
4	60	Warfarin	13.0	14.0	10 ± 3		9 ± 2	Quinidine
5	63	Warfarin	14.0	14.0	8 ± 3		12 ± 1	Disopyramide
6	70	Warfarin	14.5	16.0	11 ± 2		14 ± 2	Disopyramide
7	62	Warfarin	13.0	14.0	9 ± 6		11 ± 3	Disopyramide

NS = Not significant.

After conversion of atrial fibrillation and start of quinidine or disopyramide an increase of about 10% was needed in the dose of dicoumarol or warfarin to keep the thrombotest value within the therapeutic range. Although the number of patients was small the same increase in anticoagulant dosage was required when patients were treated with either dicoumarol or warfarin in combination with quinidine sulphate or disopyramide.

Comment

Warfarin and other anticoagulant agents such as dicoumarol interact with a large variety of drugs. Both an increase and a decrease in anticoagulant action may be observed clinically. Only Haworth and Burroughs¹ have reported an interaction between disopyramide and warfarin. In contrast with other reports,² we found a decreased anticoagulant effect when dicoumarol or warfarin was combined with quinidine. A decreased effect was also observed in two of the three patients receiving warfarin when disopyramide was added.

The mechanism for the observed need for an increase in anticoagulant dosage after conversion of atrial fibrillation to sinus rhythm is unknown. Nevertheless, that patients treated with quinidine or disopyramide showed the same decrease in anticoagulant effect after conversion suggests that haemodynamic factors might be implicated. In sinus rhythm regular atrial contractions might contribute to increased cardiac output and increased liver blood flow. This might result in an enhanced production of prothrombin and other coagulation factors, requiring a higher anticoagulant regimen. The patient described by Haworth and Burroughs was, in fact, initially hypotensive but recovered after discontinuation of the disopyramide. Thus their patient initially had a low cardiac output that later returned to normal, which also might explain the observed decrease in prothrombin time.

¹ Haworth E, Burroughs AR. Disopyramide and warfarin interaction. *Br Med J* 1977;**iii**:866-7.

² Koch-Weser J. Quinidine-induced hypoprothrombinemic hemorrhage in patients on chronic warfarin therapy. *Ann Intern Med* 1968;**68**:511-7.

(Accepted 12 January 1983)

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Effect of doxapram on heavy sedation produced by intravenous diazepam

Diazepam is widely used to provide sedation during endoscopy, biopsy procedures, and minor surgery. Given intravenously it may cause excessive sedation and ventilatory depression. There is no specific antidote. We carried out a randomised controlled trial of the effects of doxapram in patients heavily sedated with intravenous diazepam.

Patients, methods, and results

We studied 115 patients undergoing gastroduodenoscopy with intravenous diazepam sedation; no other sedation or premedication was used. None of