Our observation of an α -cell response to arginine stimulation comparable with that seen in idiopathic diabetes agrees with the observations of Passa *et al*⁴ and contrasts with the impaired responses found in patients with transfusional haemosiderosis, suggesting that factors other than iron deposition play a part in the genesis of diabetes associated with IH. In IH, however, there may possibly be a selective destruction of the β -cell, the high plasma glucagon values thus merely reflecting insulin lack, and it is of interest that McGavran *et al*,⁵ in necropsy studies, observed more iron in the β -cells than in the α -cells. This predisposition of the β -cell for iron deposition was, however, also noted in transfusional haemosiderosis. Clearly further histological studies using modern techniques are indicated.

Hepatic cirrhosis (proved in nine of our cases) may contribute to the diabetes associated with IH, but is unlikely to be the cause of the high glucagon concentrations, since liver function values were abnormal in only two of our cases and there was no evidence of portocaval shunting.

These findings add to the accumulating evidence that diabetes in patients with IH is not due solely to islet cell damage by iron.¹⁻⁴ Several factors, including hepatic cirrhosis, genetic influences, or iron deposition, might play a part. Each of these may operate to varying degrees in individual cases.

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² Dymock, I W, *et al*, *American Journal of Medicine*, 1972, **52**, 203.

³ Lassman, M, *et al*, *American Journal of Internal Medicine*, 1974, **80**, 65.

⁴ Passa, P, *et al*, *Diabetologia*, 1977, **13**, 509.

⁵ McGavran, M H, and Hartroft, W, *American Journal of Pathology*, 1956, **32**, 631.

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Partial mastectomy for breast cancer

Survival from breast cancer depends mainly on whether general and progressing disease is present at diagnosis, and clinicians look for treatment that, while controlling local recurrence, causes the least mutilation and morbidity. Crile *et al*¹ reported that results of partial mastectomy without supplementary radiotherapy equalled those of total mastectomy. I carried out a pilot study of partial mastectomy without radiotherapy.

Patients, methods, and results

I studied 44 patients with histologically proved invasive carcinoma. The series was consecutive apart from patients excluded because they had more than one primary growth in the same breast; fixity of the primary growth or affected axillary nodes to the deep fascia; widespread "peau d'orange"; or less than 2 cm between the nipple and the growth's palpable edge nearest the nipple (because it seemed pointless to preserve the breast without the nipple). Thus some extremely large growths and central growths were excluded.

The growth was excised with 2 cm of apparently normal tissue all round (overlying skin, breast substance, and deep fascia over pectoral muscles). If the axilla contained nodes thought to be diseased it was dissected.

Follow-up was three-monthly for the first three years and lasted for 36-72 months. Several deaths occurred.

INITIAL LESIONS

Size and position of lesions—Growth diameter was 0.5-5.0 cm (average 2.0 cm). Five growths were in the medial and 28 in the lateral halves of the breast; seven were in intermediate positions.

Axillary nodes were thought to be diseased and were dissected in 13 out of 40 cases, but in only nine was malignant disease confirmed histologically. Six axillary recurrences occurred in the remaining 27 patients.

RECURRENCES

Tumours recurred in the same breast in 14 out of 38 patients (37%) who survived for three years or more. Recurrences developed 6-41 (average 25) months after operation. Eight of the 28 patients with lateral tumours, two of the five with medial tumours, and three of the seven with tumours in the intermediate zone developed recurrence in the same breast.

Diameter of tumours recurring in the same breast was on average 2.3 cm. *General disease* became apparent in 14 of the 44 patients (31%). The manifest disease-free interval was 4-40 (average 23) months.

Further management—All patients with histologically proved recurrences underwent total mastectomy or axillary dissection, or both.

Comment

This high rate of recurrence in the same breast contrasts with the results of Crile *et al*.¹ The two largest growths (5.0 cm diameter) and one of the smallest (0.5 cm) were recurrences, so inadequate excision may have been a factor. In all but one case the recurrence lay in or immediately deep to the operation scar, suggesting that the wound became colonised by malignant cells migrating through apparently normal tissue.

Greening *et al*² studied a small series of carefully selected patients with small growths and no axillary disease. Treatment was by quadrant excision and axillary dissection alone. Although only half their patients had been followed up for three years at the time of the report, the rate of recurrence in the same breast was already 15%. Other workers have found local recurrence rates of 15% without and 4% with radiotherapy after simple mastectomy,³ and of 9%⁴ and 18%⁵ after extended tylectomy and radiotherapy.

This pilot trial was concluded immediately the trend towards a local recurrence rate of 37% became apparent. Simple mastectomy with or without radiotherapy appears to be the minimum treatment likely to control local recurrence. Fortunately most patients accept this calmly, and in this series patients were not noticeably relieved to hear that they were to lose part rather than all of the breast. The incidence of systemic disease at three years was 31% compared with 25% reported for mastectomy with or without radiotherapy.³ This difference was probably not significant.

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³ Cancer Research Campaign, *British Medical Journal*, 1976, **1**, 1035.

⁴ Atkins, H, *et al*, *British Medical Journal*, 1972, **2**, 423.

⁵ Taylor, H, *et al*, *British Journal of Surgery*, 1971, **58**, 161.

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Long-term survival after resection of carcinoma of the oesophagus

In 1913 Torek reported the case of a patient who survived for 13 years after resection of a carcinoma of the oesophagus.¹ Since then no comparable survival has been recorded. I describe here a patient who survived for 31 years, in good health, after resection of carcinoma of the oesophagus.

Case report

In 1947 a 54-year-old woman was referred to Hammersmith Hospital in a condition of extreme emaciation. Several months earlier she had developed dysphagia; this had become progressively worse and on admission was almost complete. Her condition was such that even investigations could not be carried out safely until her nutrition had been improved. Accordingly a feeding jejunostomy was made. Her condition improved rapidly and investigations showed what appeared to be a carcinoma near the lower end of the thoracic oesophagus. Three weeks after the start of jejunostomy feeding she was judged fit for operation.

The site of the lesion was confirmed through a left sided abdominothoracic incision, and the carcinoma was resected and an oesophagogastric anastomosis performed. She made an uninterrupted recovery and was discharged on the 22nd day after operation. Histological examination of the tumour showed squamous cell carcinoma.

Over the years I had regular news of the patient both from herself and from her family doctor. She had no recurrence of her dysphagia.

In May 1978 her son wrote to the hospital to say that his mother had just died at the age of 85 "as a result of a stroke."

¹ Torek, F, *Journal of the American Medical Association*, 1913, **60**, 1533.

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Atenolol and metoprolol in mild hypertension

We report the findings of a study of the cardioselective β -adrenoceptor antagonists atenolol and metoprolol in the treatment of patients with mild hypertension.

Patients, methods, and results

The procedure we followed has been described.^{1,2} The protocol excluded patients whose lying diastolic pressure fell below 90 mm Hg after a four-week outpatient run-in period on a matching placebo. A double-blind cross-over method was then used to assess the effects of four treatments each provided by identical-looking capsules and given twice daily at 8 am and 6 pm for a four-week period: (1) atenolol 100 mg, (2) atenolol 200 mg, (3) metoprolol 100 mg, and (4) metoprolol 200 mg. The order of administration was determined by a random code and each patient received all four treatments. Four-week wash-out periods on matching placebo were included between the active treatment periods.

Blood pressures were recorded by Hawksley random-zero sphygmomanometers (diastolic pressure phase 4) under standard conditions.^{1,2} The mean of two or three blood pressure readings after three to five minutes lying and two to three minutes standing was recorded. A single measurement of pulse and blood pressure was taken immediately after completion of a predetermined exercise load.^{1,2} The observer not recording the blood pressure completed in another room a separate questionnaire on symptoms. Questions covered volunteered information and included specific items about general wellbeing, dizziness, headaches, energy, tiredness, mood, sleep, dreams, and bowel habit. An analysis of variance was used to examine

the non-active treatment periods. After testing for overall differences (F test) Student's *t* test was used on adjusted means to look at differences between pairs. An analysis of covariance was used to examine the active treatments, fitting the immediately preceding non-active treatment as the covariate. F tests and *t* tests were performed as above. The trial was analysed on information from 20 patients (11 men) aged 31-58 (mean 45.6) years with a mean initial weight of 70.3 kg (range 54-93 kg). Capsule counts were satisfactory throughout (>90%).

The run-in, treatment, and wash-out period means of blood pressure, pulse, and weight are shown in the table. The mean lying and standing blood pressures after the four-week run-in period on placebo were 156/101 and 151/106 mm Hg. The reduction in the mean lying and standing blood pressure for both doses of atenolol and metoprolol was approximately 16/14 mm Hg. There was no significant difference in hypotensive effect or effect on pulse rates or weight between atenolol and metoprolol at either dose after four weeks' treatment. All treatment periods were significantly superior to the run-in and wash-out periods. No sequence effects were seen when the non-treatment periods were examined. No differences were found between the results obtained for the first and second fortnights of the wash-out periods. Analysis of reported side effects showed similar patterns throughout the active and non-treatment periods. Further details of the analysis may be obtained from NPB.

Comment

This study shows that atenolol and metoprolol act equally in reducing raised blood pressure levels in the dosage range studied (200 and 400 mg/day). We have previously shown that increasing the dose of atenolol does not significantly increase any hypotensive effect in doses of 50, 100, and 200 mg once daily³; 200 or 400 mg/day given as two doses²; or 150 or 300 mg day given in three doses.⁴ A similar lack of increased hypotensive effect appears to hold also for metoprolol in the range 200 and 400 mg/day.

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² Petrie, J C, *et al*, *British Medical Journal*, 1975, **4**, 133.

³ Jeffers, T A, *et al*, *British Journal of Clinical Pharmacology*, 1977, **4**, 523.

⁴ Webster, J, *et al*, *British Medical Journal*, 1977, **1**, 76.

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Mean ($\pm$ SE of mean) blood pressure, pulse rate, and weight during run-in, treatment, and wash-out periods

	Run-in visits:			Atenolol				Metoprolol				Wash-out					
				200 mg/d		400 mg/d		200 mg/d		400 mg/d		1		2		3	
	1	2	3	2 wk	4 wk	2 wk	4 wk	2 wk	4 wk	2 wk	4 wk	2 wk	4 wk	2 wk	4 wk	2 wk	4 wk
Blood pressure (mm Hg)																	
Lying:																	
Systolic	159.8 $\pm$ 5.4	154.7 $\pm$ 4.7	156.4 $\pm$ 3.3	139.3 $\pm$ 8.4	138.6 $\pm$ 6.9	135.8 $\pm$ 5.8	138.6 $\pm$ 6.4	140.5 $\pm$ 6.2	137.5 $\pm$ 5.9	136.5 $\pm$ 3.9	141.3 $\pm$ 7.0	152.8 $\pm$ 6.5	152.1 $\pm$ 5.1	151.3 $\pm$ 5.5	157.1 $\pm$ 6.8	151.4 $\pm$ 5.0	153.5 $\pm$ 5.7
Diastolic	104.4 $\pm$ 2.2	101.4 $\pm$ 3.1	101.4 $\pm$ 1.9	86.7 $\pm$ 2.6	87.5 $\pm$ 2.2	87.0 $\pm$ 2.1	86.5 $\pm$ 2.4	84.3 $\pm$ 2.0	86.7 $\pm$ 2.0	85.5 $\pm$ 2.1	88.4 $\pm$ 2.1	97.0 $\pm$ 2.1	98.2 $\pm$ 2.5	96.9 $\pm$ 2.3	100.1 $\pm$ 2.5	98.2 $\pm$ 2.5	96.6 $\pm$ 2.4
Standing:																	
Systolic	159.3 $\pm$ 6.0	150.0 $\pm$ 5.4	151.2 $\pm$ 4.5	133.1 $\pm$ 7.5	134.7 $\pm$ 6.7	132.4 $\pm$ 5.3	135.2 $\pm$ 5.6	136.8 $\pm$ 7.2	134.6 $\pm$ 5.6	133.2 $\pm$ 5.6	135.8 $\pm$ 6.8	151.3 $\pm$ 7.6	146.9 $\pm$ 4.7	150.8 $\pm$ 6.1	150.3 $\pm$ 5.7	146.0 $\pm$ 5.3	148.9 $\pm$ 5.3
Diastolic	110.1 $\pm$ 2.2	105.9 $\pm$ 2.1	105.6 $\pm$ 2.3	91.3 $\pm$ 2.7	92.1 $\pm$ 1.9	92.4 $\pm$ 2.0	90.7 $\pm$ 2.4	91.4 $\pm$ 2.4	93.0 $\pm$ 2.1	91.4 $\pm$ 2.4	93.2 $\pm$ 2.5	101.7 $\pm$ 2.6	104.5 $\pm$ 2.4	101.3 $\pm$ 2.5	105.6 $\pm$ 2.7	102.9 $\pm$ 2.3	103.6 $\pm$ 2.0
After exercise:																	
Systolic	170.3 $\pm$ 5.3	165.4 $\pm$ 6.5	167.2 $\pm$ 5.8	145.6 $\pm$ 7.5	143.3 $\pm$ 7.2	139.2 $\pm$ 5.4	141.7 $\pm$ 6.7	147.7 $\pm$ 7.1	146.6 $\pm$ 6.7	144.6 $\pm$ 7.5	142.9 $\pm$ 8.6	166.7 $\pm$ 7.0	163.3 $\pm$ 5.9	164.7 $\pm$ 6.8	163.8 $\pm$ 5.5	162.3 $\pm$ 7.9	170.2 $\pm$ 8.3
Diastolic	108.1 $\pm$ 2.4	105.5 $\pm$ 2.1	102.8 $\pm$ 2.5	89.9 $\pm$ 2.5	90.2 $\pm$ 2.6	89.3 $\pm$ 1.8	87.3 $\pm$ 2.9	90.7 $\pm$ 2.3	92.2 $\pm$ 1.7	90.7 $\pm$ 3.0	88.7 $\pm$ 3.0	99.3 $\pm$ 3.2	101.3 $\pm$ 2.7	99.1 $\pm$ 2.6	102.1 $\pm$ 2.4	98.7 $\pm$ 3.0	98.6 $\pm$ 3.0
Pulse rate (beats/min)																	
Lying	83.4 $\pm$ 3.8	84.1 $\pm$ 3.6	85.8 $\pm$ 3.4	62.1 $\pm$ 1.7	63.6 $\pm$ 2.2	61.8 $\pm$ 1.7	63.3 $\pm$ 1.9	64.8 $\pm$ 1.9	66.1 $\pm$ 2.0	62.7 $\pm$ 2.4	64.9 $\pm$ 2.9	81.7 $\pm$ 3.2	80.1 $\pm$ 2.8	80.7 $\pm$ 4.4	79.9 $\pm$ 3.2	81.0 $\pm$ 4.6	76.6 $\pm$ 3.9
Standing	89.8 $\pm$ 3.6	91.3 $\pm$ 4.2	92.4 $\pm$ 3.0	67.1 $\pm$ 2.5	67.7 $\pm$ 2.8	63.9 $\pm$ 2.0	66.7 $\pm$ 2.4	68.9 $\pm$ 2.4	69.3 $\pm$ 2.6	65.0 $\pm$ 2.3	70.0 $\pm$ 3.3	91.3 $\pm$ 3.2	87.5 $\pm$ 3.4	89.2 $\pm$ 4.6	86.1 $\pm$ 3.7	89.6 $\pm$ 4.7	89.3 $\pm$ 3.4
After exercise	119.3 $\pm$ 5.3	117.9 $\pm$ 4.7	116.6 $\pm$ 3.7	83.1 $\pm$ 3.2	87.8 $\pm$ 4.4	82.3 $\pm$ 3.3	79.8 $\pm$ 4.0	90.9 $\pm$ 3.1	89.4 $\pm$ 3.4	83.4 $\pm$ 4.2	86.8 $\pm$ 5.1	118.6 $\pm$ 4.9	117.2 $\pm$ 4.9	118.6 $\pm$ 4.5	115.4 $\pm$ 4.3	117.9 $\pm$ 5.4	122.6 $\pm$ 3.5
Weight (kg)																	
	69.4 $\pm$ 2.5	69.8 $\pm$ 2.5	69.8 $\pm$ 2.4	71.3 $\pm$ 2.6	71.4 $\pm$ 2.6	71.1 $\pm$ 2.6	71.2 $\pm$ 2.7	70.2 $\pm$ 2.7	69.7 $\pm$ 2.6	71.1 $\pm$ 2.7	70.3 $\pm$ 2.7	70.3 $\pm$ 2.6	69.9 $\pm$ 2.7	70.2 $\pm$ 2.6	70.0 $\pm$ 2.6	71.1 $\pm$ 2.7	69.3 $\pm$ 2.5