PAPERS AND ORIGINALS

Primary ventricular fibrillation and resumption of work, sexual activity, and driving after first acute myocardial infarction

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Summary

The resumption of work, sexual activity, and driving were studied in 32 patients who had suffered primary ventricular fibrillation after their first myocardial infarction. They were compared with 95 patients whose myocardial infarction was not so complicated. Though initially slowing rehabilitation, primary ventricular fibrillation did not affect ultimately either the return to work or the resumption of normal sexual activity and driving.

Introduction

Most patients who experience primary ventricular fibrillation after their first acute myocardial infarction are successfully resuscitated if efficient mobile or hospital coronary care facilities are immediately available. Subsequently their life expectation is similar to that of patients with myocardial infarctions uncomplicated by this arrhythmia.¹ What is not known is whether the outcome of primary ventricular fibrillation affects the speed or the completeness of the social and psychological rehabilitation of these patients, most of whom should be able to gain satisfactory re-employment and assume normal life.

We therefore studied the course of rehabilitation in patients whose first acute myocardial infarction was complicated by primary ventricular fibrillation.

Patients and methods

Two groups of patients were studied.

The *ventricular fibrillation (VF) group* consisted of 32 patients who were all under the age of 65 and had been discharged from Kingston General Hospital, Hull, between November 1967 and August 1974, having survived primary ventricular fibrillation as a consequence of their first myocardial infarction. Ventricular fibrillation was defined as primary if it occurred without heart failure, hypotension, or shock. They had all been fully employed for at least 10 years before admission to hospital and had had no immediate plans for retirement. Those patients whose previous jobs were considered inappropriate after their myocardial infarction—for example, bus or heavy goods vehicle drivers—were excluded from the study.

The *control group* consisted of 95 patients who had all been discharged from Kingston General Hospital, Hull, between February 1973 and August 1974 having survived their first acute myocardial infarction, which had not been complicated by ventricular fibrillation.

Both groups were well matched in age (mean ($\pm$ SD), VF group 53 ± 6.5 years; control group 52 ± 7.3 years), previous cardiac and occupational histories, and drug treatment. The routine management of patients admitted to the coronary care unit, the criteria for the diagnosis of acute myocardial infarction, and the management of ventricular fibrillation have been described.^{2,3} Primary ventricular fibrillation was considered to be early if occurring within 72 hours of the infarction (18 patients) and late if occurring after 72 hours (14 patients).

All surviving patients were invited for review between 2 and 6 months and again between 10 months and 2 years after discharge from hospital. In addition to a full cardiovascular examination, the following information was collected: (a) the date of return to work, (b) the extent to which their job had had to be modified in terms of physical load and number of working hours, (c) when and to what extent sexual activity had been resumed, and (d) when and to what extent private driving had been resumed. When patients failed to attend these interviews information about their work after leaving hospital was obtained from their general practitioners. In such circumstances (13 patients in the VF group and 11 in the control group) no attempt was made to record information on sexual activity and driving.

Occupations were assessed independently as manual or sedentary by a unanimous (in 80% of cases) or majority (in 20%) decision of three observers (two industrial psychologists and a works manager). A job was considered to be manual if it entailed at least a moderate amount of physical activity—for example, motor fitter, electric welder, prison officer. A sedentary job was one in which there was little or no physical activity—for example, hospital catering officer, industrial training officer, clerk. The patient's work commitment (in terms of

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hours and physical load) and sexual and driving activities were graded as "full" if they exceeded 89% of the premorbid level and "reduced" if below that level.

Statistics—Data were analysed by the χ^2 test for two independent samples, the Fisher exact probability test, and the t test for two independent samples.

Results

Since it is now accepted that most patients should have returned to work and resumed a normal life within 3 or 4 months of acute myocardial infarction⁴ we assessed the rehabilitation status of our patients 4 months after they left hospital as well as after a longer period (10 months). There was no significant difference in the 4- or 10-monthly mortality rate between the two groups ($P=0.95$). Four out of 32 patients (13%) in the VF group and 5 out of 95 patients (5%) in the control group died within four months of discharge. One further patient in the VF group and a further two patients in the control group died within 10 months of discharge.

A significantly greater proportion of patients in the control group had returned to work at four months ($P=0.001$; table I), and since only 5 patients in the VF group had resumed work at this time we did not compare statistically the work capacity of the groups. At 10 months there was no significant difference between the two groups in either the proportion of patients who had returned to work or their working capacity.

A greater proportion of controls had resumed full sexual activity and driving within four months ($P=0.040$ and $P=0.047$ respectively; table II). But at 10 months these differences between the groups had disappeared (table II). Patients who had not driven or had terminated their sex life before their illness were excluded from this analysis.

Within the VF group the rate of return to work and the resumption

of normal sexual activity and driving of the 20 patients admitted before 1973 did not differ significantly from that of the 12 patients admitted after that date ($P=0.05$).

The effects of age, occupation (manual or sedentary), time of ventricular fibrillation (early or late), and site of infarct (anterior or posterior) on the return to work at 10 months were examined (table III). Age was the only single factor that clearly distinguished between those patients who returned to work and those who did not in both the VF and the control groups ($P=0.006$ and $P=0.049$ respectively). Furthermore, we discovered that the age of 58 years discriminated better than any other age between those patients who returned to work and those who did not.

Discussion

Our results support the view that the short- and long-term prognosis with respect to life expectancy of patients surviving primary ventricular fibrillation after acute myocardial infarction does not differ significantly from that of patients whose myocardial infarction has not been so complicated.⁵ On the other hand, there seem to be differences between these two groups of patients in the speed with which they return to work and in their personal and, possibly, psychological rehabilitation.

Patients in the VF group returned to work and resumed full sexual and driving activities more slowly than those in the control group. It has been shown⁶ that physical disability due to angina or dyspnoea, or both, the attitude to the illness, and the general practitioner's advice influence the rehabilitation of patients who have suffered myocardial infarction. The difference in rehabilitation four months after discharge between the VF

TABLE I—Number (percentage) of patients who returned to work and their working capacity 4 and 10 months after discharge from hospital after acute myocardial infarction

Group	Work status*			Working capacity†					
	Back at work	Not back at work	Total	Physical Load			Hours		
				Full	Reduced	Total	Full	Reduced	Total
VF	5 (18)	23 (82)	28 (100)	4 (80)	4 Months 1 (20)	5 (100)	5 (100)		
Control	62 (69)	28 (31)	90 (100)	31 (50)	31 (50)	62 (100)	40 (65)	22 (35)	62 (100)
		$P<0.001$			(Numbers too small for statistical comparison)				
VF	19 (70)	8 (30)	27 (100)	11 (58)	10 Months 8 (42)	19 (100)	17 (90)	2 (10)	
Control	76 (86)	12 (14)	88 (100)	42 (55)	34 (45)	76 (100)	56 (74)	20 (26)	76 (100)
		NS			NS			NS	

*Figures include only living patients.

†Figures include only patients who were back at work.

NS = Not significant.

TABLE II—Number (percentage) of patients who resumed sexual activity and driving within 4 and 10 months of discharge from hospital after acute myocardial infarction

Group	Sexual activity				Driving			
	Full	Reduced	Total	Inapplicable*	Full	Reduced	Total	Inapplicable*
VF	2 (20)	8 (80)	10 (100)	4 Months 5	5 (46)	6 (54)	11 (100)	4
Control	45 (65)	25 (35)	70 (100)	9	47 (77)	14 (23)	61 (100)	18
		$P=0.04$				$P=0.04$		
VF	5 (50)	5 (50)	10 (100)	10 Months 4	6 (60)	4 (40)	10 (100)	4
Control	42 (61)	27 (39)	69 (100)	8	52 (85)	9 (15)	61 (100)	16
		NS				NS		

*Patients who had terminated their sexual activity or had not driven before their illness were not included in the calculation of the percentages or the statistical analysis.

TABLE III—Effect of age, occupation, time of onset of ventricular fibrillation, and site of infarction on return to work 10 months after discharge from hospital. Results are numbers (percentages) of patients and include only patients who were alive 10 months after discharge from hospital

10-months status	Age (years)		Occupation		Time of VF		Site of infarction*	
	≥ 58	< 58	Manual	Sedentary	Early	Late	Posterior	Anterior
Back at work	3 (33)	16 (89)	12 (63)	VF Group 7 (88)	12 (80)	7 (58)	10 (77)	9 (64)
Not back at work	6 (67)	2 (11)	7 (37)	1 (12)	3 (20)	5 (42)	3 (23)	5 (36)
		$P=0.006$		NS		NS		NS
Back at work	22 (76)	54 (92)	52 (87)	Control group 24 (86)			53 (87)	23 (85)
Not back at work	7 (24)	5 (8)	8 (13)	4 (14)			8 (13)	4 (15)
		$P=0.05$		NS				NS

*True posterior infarction was not seen.

group and the controls could be explained in terms of a higher incidence of physical disability due to angina and dyspnoea in the VF group, the patients' attitudes to their disease, or over-cautiousness on the part of their general practitioners. These explanations must be speculative since we could not obtain evidence to support or refute them in view of the retrospective manner in which some of the information was collected about the patients in the VF group. Within 10 months of leaving hospital, however, these differences between the two groups had disappeared.

Recognising that unsuccessful rehabilitation after myocardial infarction could be due as much to psychological as to physical factors,⁴ it might be expected that patients whose heart attacks were complicated by ventricular fibrillation would be most adversely affected psychologically by their illness. They commonly believe, quite inaccurately, that their "Heart attack had been very severe" and often comment, "I had actually died and was brought back to life."⁷ As a result they may harbour fear of sudden death or recurring ill health—fears that should have been allayed by sympathetic and informed medical counselling before and after they were discharged from hospital. Our 10-month follow-up figures do not suggest that anxiety alone explains the failure to return to work in either group of patients. Age seemed to be the most influential factor. The only two patients in the VF group who were below the age of 58 and had not returned to work by 10 months (table III) had experienced a further acute myocardial infarction and were incapacitated by severe angina and dyspnoea.

Since age was the most useful factor in distinguishing between patients who returned to work within 10 months of their dis-

charge from hospital and those who did not, it may be advisable to consider early retirement after acute myocardial infarction in patients who are in or around their early 60s, especially if they wish to leave manual occupations and have understanding employers. A similar opinion has been expressed by Biorck.⁶

Though the controls were not ideal in that they were consecutive admissions after 1973, this selection was unlikely to have prejudiced the results of our study since VF patients admitted before 1973 behaved in the same way as those admitted after this date.

In conclusion, primary ventricular fibrillation after a myocardial infarction, though initially slowing rehabilitation, does not itself ultimately adversely affect the resumption of work and normal living.

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Lactic acidosis complicating treatment of ketosis of labour

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Summary

Hypertonic glucose, fructose, and sorbitol solutions were given intravenously to women in the first stage of labour who had ketonuria and ketonaemia as evidenced by a raised blood acetoacetate and 3-hydroxybutyrate. There was no difference in the antiketogenic action of these, which was rapid and effective, but when compared with a control group who were given normal saline they had a high incidence of hyperlactataemia, and nine out of 28 patients developed lactic acidosis after the infusions. The "lactatogenic" effect was shared by all three substrates, and when they are used in the treatment of ketosis of labour, and the mother develops lactic acidosis, they might exacerbate pre-existing lactic acidosis and precipitate fetal distress.

Introduction

The detection of ketonuria during labour is usually the first indication that ketosis exists. The combination of starvation and vomiting with depletion of carbohydrate reserves stimulates ketogenesis and ketonaemia caused by the accumulation of the ketone bodies acetoacetic acid, 3-hydroxybutyric acid, and acetone. If ketoacidosis develops and is untreated it may induce a fetal acidosis or enhance an acidosis already present as a consequence of intrauterine anoxia and also cause deterioration in the general maternal condition.

Treatment aims to provide sufficient carbohydrate intravenously to prevent further ketogenesis and correct the acidosis together with adequate rehydration. Intravenous solutions of glucose, fructose, and the polyol sorbitol are readily available for this purpose but attention has recently been drawn to the potential danger of lactic acidosis complicating intravenous fructose infusions.¹ Lactic acidosis has been reported in mother and fetus during labour after intravenous fructose,² and sorbitol might be expected to have a similar effect as it is converted by the liver to fructose.

This investigation was designed to compare and evaluate the antiketogenic action of fructose, sorbitol, and glucose with particular reference to the incidence of hyperlactataemia and lactic acidosis after infusion.

Patients and methods

Fifty women admitted in the first stage of labour with ketonuria, as indicated by a positive Ketostix test result, were divided at random into four groups, which were given either dextrose, fructose,

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