We are grateful to Dr J S Fleming and Mr G H Smith for permission to report details of this patient, who was under their care. One of us (CW) is in receipt of a British Heart Foundation research grant (No 496).


Cardiothoracic Unit and Department of Pathology, Northern General Hospital, Sheffield 5
C WARD, MD, MRCP, senior registrar
H J SAGAR, BM, MRCP, senior house officer
D COOPER, MB, MRCPATH, senior registrar

Department of Immunology, Hallamshire Hospital, Sheffield 10
A MILFORD WARD, MB, MRCPATH, consultant in charge

Plasma free fatty acid levels in acute myocardial infarction in diabetic and non-diabetic patients

Acute myocardial infarction carries a high mortality among patients suffering from diabetes mellitus and there is a suggestion that the risk of cardiovascular death may be increased by the use of hypoglycaemic drugs. A high incidence of primary ventricular fibrillation among those previously on oral hypoglycaemic drugs has also been found. As raised plasma free fatty acids (FFA) have been implicated in the genesis of cardiac arrhythmias, we considered that this may be the mechanism in diabetics, who are known to have impairment of the normal fall in FFA levels after glucose ingestion after myocardial infarction.

We therefore decided to investigate the relation between the incidence of ventricular fibrillation among diabetic patients admitted with acute myocardial infarction and the levels of circulating FFA and to compare the findings with those observed in non-diabetic people.

Patients, methods, and results

Twenty-three diabetic and 24 non-diabetic patients with proved myocardial infarction within the previous 30 hours were studied. Twelve of the diabetics were women whereas there were only two women among the non-diabetics. The mean age of the diabetic patients was significantly higher than that of the non-diabetics, but the ages of the orally treated and insulin-treated diabetics were similar. The insulin-treated group had had diabetes longer than the tablet-treated patients (15 years and 6-1 years respectively.) A venous blood sample was taken from each patient on admission, which was a mean of 6-7 hours after the onset of chest pain in the non-diabetic patients and 9-9 hours in the diabetics. The plasma sugar was measured and FFA levels estimated using a modification of the method of Dole and Meiners, substituting tetra-n-butyl ammonium hydroxide as titrant. Serum albumin was also measured within 24 hours.

Initial plasma sugar concentrations were significantly higher among the diabetic than among the non-diabetic patients (P < 0.0005), but no difference emerged between the two groups in FFA levels. There was also no significant difference in circulating FFA between those patients on oral drug treatment and those receiving insulin. Ten patients, live in each group, developed primary ventricular fibrillation. No difference was detected in the corresponding FFA levels between patients who developed this arrhythmia and those who did not, either when the results were analysed as a whole or when the diabetics were considered separately. In eight of these 10 patients, the blood sample was taken within one and a half hours of the occurrence of the arrhythmia.

Nine of the 47 patients died in hospital. Seven of these were diabetics, of whom five were on insulin. Serum albumin was lower in the diabetics than in the non-diabetics (P < 0.01). Three newly diagnosed diabetics and three on diet alone were included in the study. They had an uncomplicated progress.

Discussion

The diabetic population showed the high proportion of women and high overall mortality previously noted. The raised blood sugar in the diabetic group was evidence of lack of control of diabetes. FFA levels in diabetic and non-diabetic patients, however, did not differ significantly. Also, levels of FFA in those patients developing ventricular fibrillation were similar to those in patients who did not. Serum albumin was lower in the diabetics who might have produced more unbound FFA, which in turn might have exerted a greater effect on the myocardium, but this was not borne out by the similar FFA levels in the diabetics with and without ventricular fibrillation. The numbers in this comparison were, however, smaller. Thus, although the mean values for circulating FFA were above the threshold levels of 1-2 mmol/l, the concentrations of plasma FFA did not correlate with the development of ventricular fibrillation.

We thank Sisters P Lamb and A Rees-Jones of the cardiac care unit of the General Hospital for their help.


General Hospital, Birmingham B4 6NH
C A SYKES, MB, MRCP, United Birmingham Hospitals Endowment Fund research fellow.
A D WRIGHT, MB, FRCP(G), senior lecturer
J M MALINS, MB, MRCR, consultant radiologist
L HORSFALL, MD, FRCR, consultant radiologist
B P PENTECOST, MD, FRCP, consultant physician

Department of Experimental Pathology, University of Birmingham, Birmingham
RODNEY WATTS, PhD, research fellow

Circulating thyroid hormone concentrations and posture and venous compression

An increase in hydrostatic pressure produced by a change in posture to the upright position or application of a venous tourniquet causes a transudation of protein-free solute from the circulation with a resultant rise in plasma protein concentration. Circulating thyroid hormones are almost totally bound to serum protein and it is known

<table>
<thead>
<tr>
<th>Mean (± 1 SD) plasma FFA levels on initial blood sample after admission and in relation to ventricular fibrillation (VF) together with mean (± 1 SD) plasma sugar and serum albumin concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-diabetics (n = 24)</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>Plasma FFA (mmol/l)</td>
</tr>
<tr>
<td>Plasma sugar (mmol/l)</td>
</tr>
<tr>
<td>Serum albumin (g/l)</td>
</tr>
</tbody>
</table>

Conversion: SI to traditional units—Sugar 1 mmol/l = 18 mg/100 ml.

Br Med J: first published as 10.1136/bmj.4.5999.735 on 27 December 1975. Downloaded from http://www.bmj.com on 16 September 2023 by guest. Protected by copyright.