Plasma cholesterol after myocardial infarction

SUSAN G. COTTON*
M.B., M.R.C.P.

Grimshaw-Parkinson Research Student, University of Cambridge

Summary

Serial plasma cholesterol estimations were made at intervals up to 13 weeks after myocardial infarction in fourteen men. Wide fluctuations in these levels, occasionally in excess of 100 mg/100 ml were found during the first 3 weeks and subsequently.

The general trend was towards lowest levels about the end of the first week. The 3-week level was frequently not typical of subsequent levels, which may have been influenced by seasonal variation and body weight changes.

Introduction

The tendency for plasma (or serum) cholesterol levels to fluctuate considerably during the early weeks after myocardial infarction may be insufficiently appreciated in this country. This tendency has obvious relevance in the matter of recognition and characterization of hyperlipidaemic patients in this group, with possible prognostic and therapeutic implications. This report concerns the findings in a small group of men similar to that studied by Watson, Buchanan & Dickson (1963) who found an early fall in the cholesterol level with return to a higher, stable level about the end of the third week.

Subjects and methods

The fourteen patients studied were all men between 38 and 65 years of age when admitted to hospital with myocardial infarction. The diagnosis was confirmed by ECG and (in twelve cases) by SGOT elevation. Ten patients were treated with anticoagulants, contraindications being present in the other four. None had diabetes, thyroid disorder, nephrotic syndrome or other disease known to effect plasma cholesterol levels.

The study was carried out between December, 1968 and the end of July, 1969. Blood samples were drawn between 8.0 a.m. and 9.0 a.m. after a 12-hour fast (necessitated by contemporaneous assay of other lipid moieties including triglyceride and free fatty acids). The first sample was thus taken on

the first or second day after admission. Further samples were taken at 1, 2 and 3 weeks after admission and then, after discharge, at 9 and 13 weeks.

Plasma cholesterol was measured by an automated method based on the reagent described by Huang *et al.* (1961). The laboratory error did not exceed ± 10 mg/100 ml over the range of cholesterol levels encountered.

Results

These are shown in the accompanying table. The mean and 95% confidence limits for the group at each sampling time are shown in Fig. 1.

FIG. 1. Mean plasma cholesterol levels (with 95% confidence limits) at stated times post-infarction.

There is a downward trend in the first week (as also found by Logan & Murdoch, 1966), followed by a tendency for the cholesterol level to rise during the next 2 weeks. The apparent fall between the ninth and thirteenth week was of interest. However, none of these changes reaches currently acceptable levels of significance.

Discussion

Much greater individual variability characterized this series than was found in the patients studied by Watson *et al.* (1963). All fourteen in their group

*Present address: Sully Hospital, Sully, Penarth, Glamorgan.

TABLE 1. The plasma cholesterol levels in each individual at stated time after myocardial infarction

Patient	Age (years)	Plasma cholesterol levels (mg/100 ml)					
		First	Week 1	Week 2	Week 3	Week 9	Week 13
1. J.J.	62	180	163	165	180	263	212
2. A.R.	56	270	250	300	375	315	292
3. F.B.	53	295	260	270	270	280	233
4. D.C.	54	200	165	185	—	205	185
5. T.D.	51	225	195	245	270	240	200
6. C.V.	64	247	270	282	272	282	282
7. D.N.	50	252	288	258	259	260	305
8. J.A.	43	210	200	235	223	225	219
9. F.C.	50	247	240	275	225	275	255
10. S.P.	39	270	278	300	300	308	252
11. E.G.	54	226	240	226	269	270	280
12. A.D.	65	265	270	280	290	330	325
13. C.C.	47	252	258	247	194	228	268
14. W.T.	56	345	—	285	305	270	260
Mean		252	240	255	267	268	255
95% Confidence limits $\pm$		26	27	23	29	21	24

showed a fall in cholesterol level by day 6 (but their earlier first sample may be an important difference) and fluctuations during the subsequent rise were few in number and perhaps no greater than the method error. Anti-coagulant therapy was reported to be immaterial in this respect.

This small study confirms the tendency of the plasma cholesterol level to undergo considerable fluctuation during the early weeks after myocardial infarction (Björck, Blomquist & Sievers, 1957; Kuo, 1960; Ravel 1969). The trend appears to be as found in the other longitudinal study covering several weeks (Watson *et al.*, 1963) but the pattern of lowest level at sixth to ninth day post-infarction, followed by a rise to the twenty-second day, is not regularly seen in all cases.

In this series the downward trend in plasma cholesterol between the ninth and thirteenth week could be related to weight reduction insofar as the seven patients showing a definite fall in cholesterol over this period also showed a mean weight loss of approximately 3 lb at the relevant time. Another possibility is that the coincidence of seasonal variation affected the plasma cholesterol levels at this stage. Nine patients, including the seven showing definite fall in cholesterol level, had their 13-week plasma samples taken between the beginning of May and the end of July and at this time of year lower plasma cholesterol levels may prevail, (Doyle, Kinch & Brown, 1965; Carlson & Lindstedt, 1969).

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