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Fish oil and plasma fibrinogen

Dr D P Mikhailidis and colleagues (3 September, p 615) suggest a possible relation between hypertriglyceridaemia and fibrinogen concentrations. They comment on the lack of appropriate triglyceride data in the paper by Dr Arne T Høstmark and others (16 July, p 180).

In 1980 an open study to observe the effects of ω -3 marine triglycerides (Maxepa) on blood lipid concentrations and coagulation was instigated in this laboratory. The results of the first four years of study on data collected from 267 patients taking 10 ml ω -3 marine triglycerides daily (1.8 g eicosapentaenoic acid) suggested a significant and progressive decrease in plasma fibrinogen concentration (table I). None of the patients showed any tendency to excessive bleeding. Serum triglyceride concentrations were significantly reduced (table II) and correlated with our earlier findings.¹ Over the same period, however, total cholesterol concentration was significantly reduced in subjects with raised baseline values and high density lipoprotein cholesterol concentration significantly increased.

The inverse relation between triglyceride and high density lipoprotein cholesterol concentrations is well known, but recent work has shown that fish

oil not only lowers triglyceride concentration but also increases fibrinolytic activity. More work needs to be done on the effects of ω -3 fatty acids on the apolipoproteins of high density lipoprotein and very low density lipoprotein and their possible role in fibrinogen reduction and fibrinolysis for it is from this subject that the answer may come.

In conclusion, we think that short term studies of atherosclerosis, which usually takes many years to manifest itself, should be interpreted with caution.

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A milestone for myocardial infarction

I was appreciative of the excellent review and summary of the findings from the second international study on infarct survival (ISIS 2) by Professor D G Julian and Drs B L Pentecost and D A Chamberlain (20-27 August, p 497).

Regrettably, however, they have not fully taken into account a number of factors in their cost benefit analyses which are necessary when introducing a new treatment to the National Health Service. They simplify the conclusions from the ISIS 2 study by highlighting that deaths from vascular disease are reduced from 12% to 9.2% with the use of streptokinase. The mortality was similarly reduced to 9.4% among those patients prescribed aspirin and to 8.0% when both aspirin and streptokinase were used.

The recommendations of the editorial, however, have much wider implications than perhaps its authors realise.

Firstly, it is now essential for all patients after a suspected acute myocardial infarction to be seen by their general practitioner within a few hours or admitted to hospital for assessment. While general practitioners are not encouraged to use streptokinase this will inevitably mean an increased admission rate to hospital, particularly of those with suspected coronaries, where the diagnosis is in doubt. Has the effect of this been quantified and what is the likely increased admission rate to hospital?

Secondly, for treatment to be effective it must be given within the first six hours. Myocardial infarction, however, is a diagnosis made in retrospect, with electrocardiographic changes and altered cardiac enzymes confirming infarction. The diagnosis cannot always be established in the early stages. Are these patients with an unclear diagnosis to be treated as if they did have an infarction? If so there will be a significant number of patients treated who do not have a coronary, thus increasing the overall costs.

Thirdly, when general practitioners are encouraged to use streptokinase in the acute situation (as I am sure will be the logical next step) will they restrict the administration of streptokinase to those with a clinically obvious coronary or, as is more likely, will they use the drug in the majority of suspected cases, thus treating a group who ultimately do not have a coronary?

When quantifying the costs of treatment to the NHS it is essential not only to identify the cost benefit to the individual patient—as has been carried out in the ISIS study—but also to establish the additional or spin off costs, which in this case have not been fully identified. The effect of the editorial will be to increase admission rates to

hospital, resulting in a reduction in hospital beds available for other conditions. Until physicians learn to adopt the rules that surgeons have learnt over the past 10 years—that is, to make a full and accurate quantification of all the costs of starting a new treatment—there will continue to be controversy about bed management in the National Health Service.

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Are GP referrals influenced by the availability of consultants?

It is well known that there are unexplained differences in the rates at which general practitioners make referrals to consultants.¹ One of the most important aspects of primary care is the general practitioner's need for advice. Dr Martin Roland and Mr Richard Morris (3 September, p 599) found that the number of outpatients was strongly associated with the provision of consultants in dermatology and three other specialties.

We investigated 5082 referrals from 141 general practitioners to dermatologists in Ringkjøbing county in Denmark² based on data from the national health service. As an expression of the referral rate to dermatologists an index of referral was estimated for every general practitioner. This index was the number of referrals to the dermatologists per 1000 patients per year, including children, standardised for age and sex to the average population in Ringkjøbing county. Six variables were evaluated in relation to the referral index: the distance to the dermatologists, the number of doctors per practice, the number of consultations per general practitioner per year, the number of patients registered, the number of consultations per 1000 patients per year standardised for age and sex, and the number of supplementary procedures per consultation. The study showed that the referral index fell with both the distance to dermatologists and the number of supplementary procedures per consultation. No correlation was found between the referral index and the four other variables studied.

The two studies show that general practitioners adjust their work to the ease of referral to specialists, and from our study doctors with a more extensive use of diagnostic and therapeutic procedures (a high number of supplementary procedures) seem to refer less often to dermatologists.

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- 1 Sørensen HT, Christensen B. Referrals from general practice to specialists in Denmark. *J R Coll Gen Pract* 1986;36:290-1.
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Occult AIDS

Dr M R Hargreaves and others (17 September, p 721) report two cases of AIDS presenting with *Pneumocystis carinii* pneumonia in elderly patients.

During the past two years we have seen in this department six cases of *P carinii* pneumonia in patients over the age of 60. Three of these patients were shown to have AIDS (one homosexual man and two who had had a blood transfusion in 1984). The fourth patient, a bisexual man, had been seropositive for HIV since 1986, and the remaining two had other immunosuppressive disease. In all

TABLE I—Fibrinogen concentrations (g/l) in patients before and after taking ω -3 marine triglycerides

Time (months)	No of patients	Mean fibrinogen		Patients with reduction (%)
		Baseline	Current	
Before ω -3 marine triglycerides	267	3.52	3.52	
1	255	3.52	3.38	63**
3	234	3.52	3.32	63**
6	203	3.57	3.24	65**
12	171	3.61	3.35	60*
18	146	3.67	3.34	64**
24	126	3.70	3.22	73**
30	112	3.74	3.15	76**
36	97	3.78	2.97	91**
42	84	3.76	2.94	86**
48	65	3.78	2.90	94**

*Significant at 1.0% level, ** significant at 0.1% level by binomial test.

TABLE II—Total triglyceride concentrations (mmol/l) in patients with raised baseline values before and after taking ω -3 marine triglycerides

Time (months)	No of patients	Mean triglyceride		Patients with reduction (%)
		Baseline	Current	
Before ω -3 marine triglycerides	212	3.76	3.76	
1	207	3.76	2.62	93**
3	183	3.72	2.33	95**
6	148	3.65	2.23	94**
12	125	3.61	2.13	94**
18	105	3.53	2.18	91**
24	91	3.60	2.16	93**
30	81	3.63	2.11	95**
36	71	3.68	2.48	92**
42	63	3.67	2.34	87**
48	50	3.75	2.43	82**

**Significant at 0.1% level by binomial test.

cases diagnosis was established on finding the pathogen in the liquid of bronchoalveolar lavage. Except in the patient who was already known to be seropositive for HIV, diagnosis was delayed and bronchoscopy was performed only when the clinical and radiological findings showed deterioration despite conventional antimicrobial treatment.

In our region 15% of patients with AIDS are over 60 because of the high prevalence of the disease (129 cases per million inhabitants) and the mean age of the population (27% over 60). *P. carinii* pneumonia is the most common opportunistic infection in patients with AIDS. We agree with Dr Hargreaves and colleagues that *P. carinii* pneumonia should be systematically considered in elderly patients with atypical, unresponsive chest infection.

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Diabetes poorly controlled by sulphonylureas

It is notoriously difficult in dietary studies to alter one variable without affecting others. This makes interpretation difficult, and, despite the value of the data collected by Dr A R Scott and others (17 September, p 707), their beliefs rather than the evidence seem to have determined their conclusions. Thus they make little of a 17% increase in total dietary energy intake (between the run in and high fibre periods) as an explanation of a 17% increase in fasting plasma glucose concentration, perhaps because they have little concept either of varying metabolic rate with varying energy intake (so body weight, which did increase by 0.8 kg, does not tell all about changes in energy intake) or of the possibility that sensitivity to the hypoglycaemic effect of endogenous or exogenous insulin may be affected by metabolic rate. They believe it difficult to prevent such increased energy intake with a high fibre, high carbohydrate diet without becoming a vegetarian. Let me assure them that the key is to eat less.

It is strange that when they proceed to observe that administration of insulin lowers glucose concentrations in patients with diabetes they allow no credit to the continuing high fibre diet in the size of the effect.

We are told nothing quantitatively about the success of the patients in achieving the aim of taking 10-15 g of leguminous fibre daily, nor do they mention the other main source in fruit of so called "soluble," better "gel-forming," best "viscous" fibre. You could easily be lulled by the abstract into believing that one gram of any fibre is equivalent to a gram of any other, a notion as absurd as the equivalence of one carbohydrate portion with another in respect of glycaemic effect.

We are given no idea of the amount of carbohydrate intake that was recommended but do note the 32% increase in total carbohydrate intake achieved by the end of the high fibre phase. You could argue that the fibre had been really effective in restricting the coincident increase in glycated haemoglobin concentration to a conventionally insignificant 6% of the run in value of 13.1%.

To be less provocative, but just as serious: the essential aim of a higher carbohydrate intake as a relief from the classic dietary persecution of the diabetic patient with a low carbohydrate regimen is that if energy intake is unchanged it will usually be accompanied by a reduced consumption of fat. This is hoped and expected to reduce macroangiopathic disease, but of course the type of fat needs attention, too. In the report by Dr Scott and others

the intake of fat actually rose (even if insignificantly) with the high fibre regimen and continued to supply more than 40% of total energy. No one need be surprised that lipid concentrations were unchanged, especially when the nature of the fibre eaten is so uncertain. The title, main results, and conclusions sections of this paper could be rewritten to give a very different impression.

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Dr T D R Hockaday misses the point of our paper: we tried to improve the glycaemic control of a difficult group of patients in whom oral glycaemic agents had failed but who had no symptoms to justify immediate treatment with insulin.

In our hands despite many hours of dietary advice and encouragement, these patients could not achieve anything like the recommendations set out by the various national diabetes associations. Despite major dietary modifications there were no beneficial effects on blood glucose control. It seems perverse for Dr Hockaday to argue that the increased fibre intake "had been really effective" in reducing the rise in haemoglobin A₁ concentration. Improved glycaemic control was the aim of the study, and this was achieved with insulin treatment. From our study we cannot say with certainty whether a diet containing 55% of total energy intake from carbohydrate and 40-50 g of fibre a day would have been effective, but it seems unlikely and anyway Nottingham patients were unable to eat such a diet. Rather than lamenting the fact it seems reasonable to opt for insulin treatment in the hope of reducing the incidence of late microvascular complications.

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Living under pylons

While doctors are reading Dr Tar-Ching Aw's sensible editorial (1 October, p 804) about possible harm from the low frequency electromagnetic fields generated by power lines the public are watching programmes like *The good, the bad, and the indefensible: currently at risk* (25 September, Channel 4).

Unlike the earlier *Panorama* programme¹ that of Channel 4 was sensational and biased. It was full of phrases like: "despite the growing weight of evidence from scientists." The only experts Channel 4 were interested in were those like an American biophysicist, Dr Andrew Merino, who said that there was "clear, convincing evidence" that people should not live under power lines and that it was "outrageous" for houses to be built near them. We heard of depression and suicides, raised triglyceride concentrations, and teratogenesis. There were numerous interviews with people living near power lines, who supplied anecdotal evidence of feelings of malaise, headaches, palpitations, addled eggs, and aborting cows: the sort of evidence used to condemn witches in the Middle Ages.

The only dissenting scientific voice was that of Dr John Bonnell, and, as he is health adviser to the Central Electricity Generating Board, his views were cleverly neutralised by juxtaposing interviews warning of the danger of believing anything said by a "non-independent" scientist. If Dr Aw was interviewed for the programme the interview was not broadcast.

Implying that the figures speak for themselves, the commentary told of four suicides in a community of 78 houses that lay underneath a power line and said that the chances of this were one in 5000. To the uninformed this may sound

impressive; in fact, with about 17 million households in Great Britain there should be about 40 such groups of 78 in which four suicides would be found. As Dr Aw wrote, links with suicide and the outcome of pregnancy are "inconsistent and uncertain": not the impression given by the programme.

Low frequency electromagnetic radiation may have some effects on humans, but they will be trivial compared with those of tobacco, alcohol, and road accidents; it was irresponsible of Channel 4 not to mention relative risks.

The writers clearly had no idea of, or rejected, the scientific basis of epidemiology: "This exercise in self policing [by the Central Electricity Generating Board] has so far given power lines a clean bill of health and effectively discounted fears within the scientific community that the 80 000 people living underneath or close by power lines will be the raw data of future medical surveys, with more unwitting volunteers being added week by week."

We are all the raw data of medical surveys. Better an unwitting volunteer in properly conducted epidemiology than the victim of a witch hunt.

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An inspector calls

The suggestion of a national inspectorate to monitor and maintain satisfactory standards in all hospitals has indeed been around since before the birth of the National Health Service, as mentioned by Dr Nick Black (8 October, p 875). With the increasing call in both the medical and lay press over the past 10-15 years for effective audit, it is, if anything, somewhat surprising that the concept has not been resurrected sooner.

We, as clinicians, are being held increasingly responsible for both the cost effectiveness and the efficiency of patient management. The standards of patient care can, however, be maintained or improved only if we are provided with accurate information on clinical activities. The main source of data on patients has until recently been the Hospital Activity Analysis. Since 1 April 1987 the information collected on patients has been slightly modified according to a dataset recommended by the Körner reports. The changes implemented by Körner will not affect the poor quality of the clinical information produced as the same fundamental inaccuracies remain.

The Hospital Activity Analysis has previously been shown to produce data of poor quality.^{1,2} We recently carried out a study to assess its current accuracy with respect to diagnostic and operation coding. All patients presenting to one consultant general surgeon during a period of six months were reviewed. The discharge summaries were all written by one person and in a standard format, with the diagnosis and operation clearly stated at the head of the summary. A copy of the discharge summary was sent to the district information office, where a clerk coded both the diagnosis and the operation. Out of a total of 243 patients, 183 required operative treatment. Thirty one diagnoses and 14 operations were inaccurately coded. The accuracy of diagnostic and operative coding was thus 87% and 92%, respectively. We found repeated errors in the coding of biliary tract disease, which accounted for eight out of the 31 wrongly coded diagnoses; and, perhaps more importantly, out of 39 patients with malignant disease, five were wrongly coded, the disease being either incorrectly located or labelled as benign disease.

Although our figures may suggest that an im-