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you ask in your editorial—forms the kernel of the argument for both interdisciplinary students and interdisciplinary staff in the teaching of community health. In my opinion, a health professional is a person whose work has some effect on the health of the community, either directly or indirectly (i.e., economists, school teachers, veterinarians, and so on), and who undertakes further training in the health-related aspects of his work. All such people, if suitably qualified, would be welcome on the M.COMM.H. course.

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EPIDEMIOLOGY OF CROHN'S DISEASE

SIR,—Dr Barker and Dr Gardner (Nov. 9, p. 1140) were right to draw attention to the regional variation in discharge-rates for Crohn's disease and ulcerative colitis in England and Wales. We decided to use national rather than regional data to compare with our own and that from the specified countries in Northern Europe, where prevalence of the disease is comparable with our own figure. Considerable caution is necessary in interpreting regional data because it is not collected with the same care as that given to special studies.

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PORTACAVAL SHUNT IN HYPERLIPIDÆMIA

SIR,—Twice previously in this journal we described amelioration of symptoms in an 11-year-old girl with homozygous type-IIa hyperlipoproteinæmia following end-to-side portacaval shunt.[1,2] Preoperatively, the child had suffered severe myocardial infarction. After operation, serum cholesterol and low-density-lipoprotein concentrations were reduced. Cutaneous and tendinous xanthomas underwent resorption. There was apparent regression of cardiovascular disease with relief of angina and reversal of aortic stenosis. However, coronary angiograms 16 months after portacaval shunt showed three residual tight stenoses: one at the bifurcation of the left coronary artery into the circumflex and left anterior descending arteries; a second more distal in the circumflex artery; and the third in the right coronary artery. A coronary bypass procedure was decided against because of the belief that these lesions might resolve spontaneously.

The patient was last seen by us on Sept. 14, 1974, as the subject of a Grand Rounds at the University. She felt well and had normal liver-function tests. On Sept. 23, while walking home from school, she collapsed in the street and died immediately. At necropsy, 18½ months after portacaval shunt, the most important findings were in the cardiovascular system. The heart was greatly enlarged, weighing 510 g. (normal 200 g.). There was a large left ventricular aneurysm which was the result of the old myocardial infarction. The three coronary-artery stenoses identified by angiography 3 months earlier were still present but there were no thromboses or areas of fresh infarction. The aortic valve easily admitted the tip of a finger. Many arteries, as well as the aorta, had residual xanthomatous deposits. The right and left lungs weighed 415 and 340 g., respectively, and had histological features consistent with the chronic right-heart failure from which she had suffered since the original myocardial infarction.

The liver, which weighed 618 g., was grossly normal, and microscopically it was unchanged from the biopsy obtained 6 months postoperatively.[1] The portacaval shunt was widely patent. From the clinical course and the necropsy findings, the conclusions of the clinicians and pathologists was that death was by an acute cardiac arrhythmia related to the residual coronary-artery disease and/or the earlier myocardial infarction.

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PORTACAVAL SHUNT IN FAMILIAL HYPERCHOLESTEROLÆMIA

SIR,—The reports [1,2] by Dr Thomas Starzl and his colleagues of the successful use in one patient with homozygous familial hypercholesterolæmia of an end-to-side portacaval shunt has engendered much discussion. The effects of the procedure, and the needs and opportunities for further clinical research that it suggests, were lately commented on in a paper and an editorial.[3,4]

We should like to report briefly on a workshop on this subject held at the National Heart and Lung Institute, Bethesda, Maryland, on Aug. 1 and 2, 1974. The workshop was prompted by the implications the initial observation has both for therapy and for the better understanding of lipid metabolism and atherogenesis. The small group of discussants considered the definition and natural history, the pathophysiology of hypercholesterolæmia, treatment by various means, and the portacaval shunt. Some recommendations on the applicability of the shunt for homozygous familial hypercholesterolæmia and for research needs arose from this discussion*:

Conclusions and Recommendations

(a) The diagnostic criteria for homozygous familial hypercholesterolæmia include serum-cholesterol levels in excess of 500 mg. per 100 ml., hypercholesterolæmia in both parents, or, in the absence of a parent, in both family lines; and the appearance of xanthomas in the first decade of life. While these diagnostic criteria may be expanded and usefully include tissue-culture criteria, the above descriptors constitute a minimum characterisation for this diagnosis.

(b) This inborn error of metabolism so limits life expectancy that it justifies prompt and intensive treatment, including innovative measures.

(c) The medical treatment of choice is a combined regimen of a low-fat, low-cholesterol diet with a high P/S fatty-acid ratio; a bile-acid sequestrant such as cholestyramine (up to 32 g. per day); and nicotinic acid (up to 3·0 g. per day) to the limits of tolerance, but monitored to avoid abnormally high serum-transaminase levels. Successful medical management includes both a major (40% or more) and fairly prompt reduction in serum-cholesterol and the slower resolution of xanthomas. It is unproven at present whether these attributes of management are also accompanied by a regression of atherosclerotic vascular disease and a significant prolongation of life. Medical management may have little or no effect on some patients.

(d) The portacaval shunt is an innovation for homozygous

* A more complete summary of the workshop, including a selected bibliography, is available on request from the Atherogenesis Branch, Division of Heart and Vascular Diseases, National Heart and Lung Institute, Bethesda, Maryland 20014, U.S.A.

1. Starzl, T. E., Chase, H. P., Putnam, C. W., Porter, K. A. *Lancet*, 1973, ii, 940.
2. Starzl, T. E., Chase, H. P., Putnam, C. W., Nora, J. J. *ibid.* Sept. 21, 1974, p. 714.
3. Ahrens, E. H., Jr. *ibid.* Aug. 24, 1974, p. 449.
4. *ibid.* p. 444.

familial hypercholesterolæmia that deserves intensive evaluation and study. It is recommended that, for the present, its use should be restricted to the patient with severe homozygous familial hypercholesterolæmia who has clinical vascular disease and who fails to respond to intensive medical therapy.

(e) The procedure should be carried out in institutions with the necessary diagnostic, surgical, and investigative metabolic expertise to assure, as far as possible, a successful clinical outcome, an adequate medical and neuropsychiatric follow-up, and the capability to study important metabolic parameters. Intercentre cooperation will be helpful. Collaboration with reference laboratories that have specialised in the conduct of certain specific but uncommon tests is recommended, both in order to facilitate the performance of the tests and to standardise their quality.

(f) The development of a central patient registry is recommended to facilitate the prompt collection of information about both medical and surgical managements of homozygous familial hypercholesterolæmia, and to act as a responsive resource for investigators and others interested in this problem.

Not only is homozygous familial hypercholesterolæmia a rare disorder, but there are relatively few medical centres in the world capable of the sophisticated sterol, lipoprotein, and other studies that may advance our knowledge. Indeed, intercentre collaboration may be needed if some investigations are to be performed economically and in the most appropriate way.

In these circumstances it is advisable to facilitate scientific communication, to pool ideas and data, to make the most of such data as may be obtained, and to enhance the contribution of future investigations.

To this end the National Heart and Lung Institute has offered to act as an initial focus or registry for information exchange on current or planned shunt procedures for this condition. Investigators active in this area are urged to communicate with S. M. at the Institute.

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THE VULNERABLE MYOCARDIUM

SIR,—As you have rightly pointed out in your editorial (Oct. 26, p. 994) too little serious attention has been given to those proposing "unconventional" hypotheses for our modern epidemics of myocardial infarction, diabetes, &c. Anyone reading Cleave's latest work [1] must be struck by the strength of his arguments. Trowell [2] has added fuel to this fire with his survey of diabetes death-rates and their relation to diet.

In addition to the epidemiological evidence advanced by Cleave and others, Anderson [3] postulated an attractive biochemical hypothesis related to a myocardium left vulnerable to insult because, through a lack of dietary antioxidants, the myocardial metabolic machinery is incapable of withstanding the dystrophic effect of peroxides. He finds that the modern diet has been: (1) stripped of *d*-α-tocopherol; and (2) supplemented with polyunsaturated fatty acids. Using this sort of approach, one could go directly to a myocardial infarction without necessarily having atherosclerosis. Support for such a hypothesis comes from Richardson et al.[4] who have found angina pectoris in patients with normal coronary arteries.

We have grown to accept the view that atherosclerosis causes myocardial infarction, the pendulum having swung so far that many Governments are now officially in favour of increased polyunsaturates. In view of this counter hypothesis, such action could potentially exacerbate the problem.

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1. Cleave, T. L. The Saccharine Disease. Bristol, 1974.
2. Trowell, H. *Lancet*, 1974, ii, p. 998.
3. Anderson, T. W. *ibid.* 1973, ii, 298.
4. Richardson, P. J., Livesley, B., Oram, S., Olsen, E. G. J., Armstrong, P. *ibid.* 1974, ii, 677.

ISCHÆMIC HEART-DISEASE AND DIET

SIR,—Your leader (Aug. 24, p. 444) on portacaval anastomosis for metabolic disease drew attention to the remarkable case of a child reported by Starzl et al.[1,2] with xanthomas, myocardial infarction, and serum-cholesterol level of 900 mg. per 100 ml. (32·2 mmole per l.). Diet and drugs were ineffective, but intravenous feeding halved the serum-cholesterol for a few weeks. Portacaval anastomosis was followed by a fall to 240 mg. per 100 ml. (6·3 mmole per l.), resolution of xanthomas, and relief of angina. The endoplasmic reticulum of the liver cells was reduced after operation, suggesting that cholesterol production may have decreased.

An enzyme system responding by an increase when exposed to high concentrations of substrates would fit the observations, the high concentrations of digestion products reaching the liver after each meal being reduced by intravenous feeding or portacaval shunt.

The implications of this theory are: (1) intragastric drip feed should be as effective as intravenous "feeding"; numerous small feeds spread over the day may lower the serum-lipids without a change in total intake; (2) the restriction of cholesterol, saturated fats, and simple sugars may owe some of their failure to the custom of one large meal per day.

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EPSILON-AMINOCAPROIC ACID

SIR,—We were very pleased to learn that Mr Uttley and Mr Richardson (Nov. 2, p. 1080) have not seen serious complications resulting from the administration of antifibrinolytic drugs in a large series of patients with subarachnoid hæmorrhage.

We would, however, wish to question their assertion that the re-bleeding-rate of 12% which they found in their treated patients is "much superior" to the natural history of the condition. In a large cooperative study, to which the authors were themselves major contributors, the re-bleeding rate in cases of aneurysms of the anterior part of the circle of Willis was 10% in the first week, 12% in the second, 7% in the third, and 8% in the fourth.[3] These figures cannot be simply summated to obtain the re-bleeding rate over 2 or 3 weeks because the population of patients at risk is diminishing with time. The figure of 12% given in the trial of antifibrinolytic agents would seem to be an underestimate of the risk of re-bleeding, since some patients will have undergone surgical occlusion of their aneurysms or will have died.

It is a matter of considerable importance to establish statistically whether antifibrinolytic therapy offers significant protection against re-bleeding from aneurysms. We and many other neurosurgeons would be immensely grateful to Mr Uttley and Mr Richardson if they could present firm evidence.

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J. DOUGAS MILLER.

1. Starzl, T. E., Chase, H. P., Putnam, C. W., Porter, K. A. *Lancet*, 1973, ii, 940.
2. Starzl, T. E., Chase, H. P., Putnam, C. W., Nora, J. J. *ibid.* Sept. 21, 1974, p. 715.
3. Locksley, H. B. *J. Neurosurg.* 1966, 25, 321.