POINTS OF VIEW

Eradicating sources or removing results

DENIS P. BURKITT

C.M.G., M.D., D.Sc. (Hon), F.R.C.S., F.R.C.P.I. (Hon), F.R.S.

Unit of Geographical Pathology, St Thomas's Hospital Medical School, London SE1 7EH

Summary

With few exceptions, the prevalence of disease has never been reduced by improved treatment. Success has followed identifying and eliminating, or reducing, causative factors. This has been true of infective disease in the West and of the great tropical epidemics. Yet vastly greater endeavour and expenditure are devoted to the treatment of non-infective diseases than to efforts to identify and tackle their causes. This in spite of the fact that they are increasingly recognized as characteristic of modern western culture.

KEY WORDS: causes, prevention, diet.

A fundamental tenet of modern medicine

It is a basic principle of any aspect of modern medical treatment that alleviation of symptoms must never be a substitute for attempts to identify and deal with the pathological processes responsible for them. All results emanate from causes and only by removal or suppression of the latter can the former be prevented. This is true of disease processes caused by bacterial or parasitic infections, metabolic disorders or nutritional deficiencies that can often be successfully treated medically by antibiotics, replacement therapy or nutritional adjustments. It is also true of more localized pathological processes that can only be satisfactorily dealt with by surgical extirpation or, in the case of cancer, attempted destruction through radiation or chemotherapy. However, the fundamental question must be asked, do these therapeutic approaches comply with the basic requirement of identification and removal of the ultimate causes of the disease in question? The knowledge now available which indicates that most diseases are the direct result of environmental influences compels an emphatically negative answer to this question unless an attempt is made to minimize the environmental factors responsible for the disease.

A lesson from the reduction in infective disease

The dramatic fall in mortality rates from various infective diseases in Britain which occurred between the middle of the nineteenth century and the outbreak of the Second World War has been documented by McKeown (1978). The fact that mortality rates had fallen to almost their present levels before the introduction of effective therapy indicates that this cannot have played the dominant role. McKeown has persuasively argued that the factors primarily responsible were improved nutrition, which increased resistance to disease, together with reduced contact with pathogenic organisms through the availability of clean water and sterilized milk, and the adequate disposal of sewage. For a few diseases, immunization proved highly effective.

The lesson to be learnt is that it was the removal or reduction of the causes of these diseases that was responsible for lowering their frequency, rather than improved therapy. The same has been true in the case of the conquest of epidemics of transmissible diseases in tropical countries. In nearly every case where success has been achieved, it has been through identification and removal of causative factors in the environment. The exceptions have been the few diseases which were eradicated through widespread immunization, obvious examples being poliomyelitis in the West, yellow fever in the tropics and smallpox worldwide.

A deficient approach to non-infective disease

Regrettably, the approach to non-infective disease has in most instances fallen far short of the requirement to discover and eliminate the ultimate source of the disease in question.

Malignant disease

The emerging clues to the causation of certain

cancers have so far done little to tip the balance of emphasis from almost exclusive concentration on cure to more than a token recognition of the role of prevention. Admittedly, the focus of treatment is seldom on mere alleviation of symptoms, but is rightly concentrated on the removal or destruction of diseased organs or tissues, be it by surgery, radiotherapy or chemotherapy. Nevertheless, much too little attention is paid to the reduction or elimination of ultimate causes, in spite of increasing awareness that most malignant tumours owe their origin to environmental factors. The means of drastically reducing the incidence of lung cancer is well within our grasp, yet the opportunity of doing so is too often ignored.

There is, at last, a consensus of agreement that cancer of the colon and rectum, the second commonest cause of death from cancer in Britain, and the most common in North America, is directly related to western diets. In recent years, converging lines of evidence have strongly suggested that patterns of eating rather than ingested carcinogens are predominantly responsible for these tumours. Suspicion lies heavily on excessive fat as playing a causative role (Wynder and Reddy, 1975), while adequate fibre is being increasingly viewed as strongly protective (Walker and Burkitt, 1976; Burkitt, 1980).

Initial work showing the importance of bacterial metabolism of cholesterol and bile acids into potential carcinogens (Hill, 1974), has been greatly enhanced by more recent evidence indicating that this process is maximal in the presence of a high faecal pH (Cummings, 1981). Since dietary fibre not only reduces pH, but also dilutes carcinogens by increasing faecal bulk, and in addition reduces duration of contact with bowel mucosa (Walker and Burkitt, 1976), it must be considered to be potentially protective against colo-rectal cancer. Cummings (1981) has gone so far as to emphasize that so important is the property of dietary fibre in lowering faecal pH and thus reducing the production of bacterial metabolites that excessive fat in the diet in the presence of adequate fibre may have relatively little effect in promoting the development of bowel cancer. Yet appropriate surgical techniques or adjuvant chemotherapy still attract far more attention than do recommendations for dietary change in the community at large.

Evidence has also been accumulating which suggests that dietary changes are possible causes of 2 more of our commonest cancers, those of the breast (Hankin and Rawlings, 1978) and endometrium (Wynder, 1975). Yet failure of therapy to significantly alter mortality rates from breast cancer has not yet diverted attention from the relative merits of radical versus conservative therapy, from the role of radiation, or of extirpation of hormonal glands,

towards reduction of potentially causative factors possible by dietary changes.

Non-malignant disease

It is, however, in the sphere of many common non-malignant diseases that the failure to consider ultimate causes has been most evident. Not only does the geographical, chronological and socio-economic distribution of these diseases point clearly to their dependence on environmental factors, but convincing evidence is now available to identify some at least of these factors with aspects of modern western culture (Trowell and Burkitt, 1981). Yet the lessons learnt with regard to infective disease, that reduction of frequency follows the removal of causes, and not improved treatment, has been almost entirely ignored.

Although surgeons rightly condemn outright the alleviation of abdominal symptoms without removing the offending organ, be it appendix, gall-bladder, or some portion of the gut, this approach is too often viewed as attending to the source of the problem, whereas it should be asked why these diseases are characteristic of communities which are more economically developed.

Efforts to prevent venous thrombosis are concentrated on the administration of anti-coagulants and if it develops, it is treated symptomatically. The evidence that this disorder is rare in third world countries and yet is as prevalent in black as in white Americans (Burkitt, 1975) indicates that it must be a potentially preventable disease, yet this aspect is largely ignored. Although in less developed countries intravenous coagulation can often be detected with radioisotopes (Osime, 1978), it rarely proceeds to clinical manifestations. Studies in Britain suggest that this may be because of enhanced fibrinolytic activity (Latto, 1978).

Although dietary modifications are now considered mandatory in the treatment of diverticular disease, hiatus hernia is still approached as if it were a worldwide problem to which man is somehow inherently prone. Resource to surgical repair is viewed as if this were treating causes. Once again diet is increasingly incriminated in its causation (Burkitt, 1981; Almy, 1981).

In the past, surgical treatment of the complications of haemorrhoids has been considered as going to the source of the problem. Recently dietary changes have been increasingly recommended in the treatment of this disease following the recognition that it is in part a manifestation of fibre deficiency (Latto, 1979). In some clinics in Holland, dietary modifications initiate the therapeutic approach (Huibregste, 1979).

It has for long been recognized that coronary heart disease reflects environmental factors and more

attention has been paid to its possible origins than has been the case with most other non-infective diseases. This has not been so with diabetes.

Diabetes mellitus Type II is undoubtedly dependent on genetic susceptibility, but the environmental factors necessary for the expression of the disease in susceptible genotypes has, until recently, received scant attention. Emphasis has been predominantly on therapy. Yet not only has the geographical distribution of the disease linked it indisputably with western culture (Anderson, 1981), but more recent work has related it to specific dietary changes (Jenkins *et al.*, 1978). The protective roles of both starch and fibre are being increasingly recognized (Anderson and Sieling, 1981).

There are other disorders that are equally characteristic of western culture such as Crohn's disease, ulcerative colitis, multiple sclerosis, thyrotoxicosis, renal stones and pernicious anaemia, but the factors in lifestyle responsible for these disorders remain unknown. Nevertheless, care must be taken lest exclusive attention to therapeutic procedures obscures the need to search for their ultimate causes. In all these diseases, the possibility of prevention must be considered to be even more important than the efficacy of cure.

Practicality of prevention

The countries that have published dietary guidelines include the United Kingdom, France, Canada, the U.S.A., Norway, Sweden and Ireland. All are in agreement that in Western countries consumption of fat and sugar should be reduced and that of starch and fibre should be increased (Turner and Gray, 1982).

The importance of fibre in particular is emphasized in the Royal College of Physicians report (1980), and the relationships between diets characteristic of modern Western culture and disease patterns in these countries has been extensively documented by Burkitt and Trowell (1975) and Trowell and Burkitt (1981). No western disease has been reported to be other than rare or uncommon in communities subsisting largely on foods rich in starch and fibre and low in fat, salt and sugar.

The growing interest in dietary fibre in relation to health is evidenced by the increase in scientific publications on the subject from 7 in 1957 to 164 in 1977 (Trowell, 1979), and no fewer than 451 papers on the subject were published in 1978. All evidence currently available strongly suggests that changes in western diets in the direction indicated would be highly beneficial, and there is little or no evidence to suggest that they could be detrimental other than in exceptional circumstances.

Even stronger recommendations can be made in

respect of tobacco smoking, a reduction in which could confidently be expected to reduce the prevalences not only of lung cancer and coronary heart disease, but also of chronic bronchitis, emphysema and some vascular disorders.

Any demand for the fulfilment of Koch's postulates before implementing preventive measures is totally impracticable for diseases like diverticulosis or bowel cancer which may depend on over 50 years of exposure to causative environmental factors.

The health record of Californian Seventh Day Adventists indicates the practicality of reducing disease by altering life style. Members of this church are predominantly vegetarians, non-smokers, and teetotallers. In this group of people, coronary heart disease risk is much reduced, and their risk of developing cancer of the large bowel or of the lung and other sites associated with smoking is less than half that of other Americans (Phillips *et al.*, 1980). The prevalence of diverticular disease in English vegetarians has been shown to be little over one third of that in non-vegetarians (Broadribb, 1980).

The hypothesis that many diseases characteristic of modern western culture are manifestations of maladaptation to dietary changes, and in particular to a reduction in fibre and increase in fat, is consistent with the epidemiological features and chronology of emergence of these diseases. Moreover, it can explain their inter-relationships both geographically and at individual patients. No one yet has offered any alternative hypothesis that can account for the epidemiological features of these disease.

Misplaced emphasis in medical education, media portrayal and health expenditure

When considering non-infective diseases, medical education still tends to concentrate on the removal or destruction of diseased tissue, or the repair of anatomically distorted structure, while paying minimal attention to ultimate causes. Although improvements have been made since my student days when no single lecture was devoted to nutrition, this all-important subject still receives much less attention than it deserves. Thoracic surgery can get pride of place over epidemiology, and the rare and exotic attracts more attention than the commonplace. Although the technical praiseworthiness of reconstructive and organ-replacement surgery is undeniable, the enormously greater news coverage accorded to these brilliant achievements in comparison to much more productive accomplishments in the field of health promotion and disease prevention is regrettable. The worldwide eradication of smallpox, saving an estimated two million lives annually, not to mention the prevention of tens of thousands of cases of blindness, received less media attention than did a

few praiseworthy cardiac transplants. The former was a brilliant extirpation of disease at source, the latter an equally brilliant temporary alleviation of symptoms. These are of course not 'either-or' but 'both-and' options. Each is commendable, but their relative emphasis needs adjustment.

The recent report by the Royal College of Physicians 'Medical Aspects of Dietary Fibre' (1980) was notable for its repeated insistence that more attention should be paid to investigating the postulated role of fibre deficiency in disease causation. Comparable emphasis should however be paid to other aspects of diet that distinguish communities with high and low prevalences of the diseases listed.

None would deny that the removal of diseased tissue is infinitely preferable to treating the symptoms for which it is responsible, but nor can anyone refute the suggestion that recognition and removal of causes will, in the long run, be more effective than either.

The Working Party established by the British Nutrition Foundation to report on dietary guidelines and their implementation concluded that 'It is essential to encourage the health professions to think in terms of prevention... This will necessitate a fundamental change in attitude, particularly in the medical profession, and will require a shift in emphasis in medical training from therapy to prevention.' (Turner and Gray, 1982).

Are we tackling the problems at source? Are our priorities right? The answer, which must surely be 'no', demands both thought and action.

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