

policies and the constitutional standing of indigenous peoples. Values, lifestyles, standards of living and culture, so important to clinical understandings, lie midway.

Health workers are more familiar with short and mid-distance factors, but improving the health of indigenous peoples requires a broad approach covering a wide spectrum of interventions. The Declaration of Health and Survival recommends several strategies including capacity building, research, cultural education for health professionals, increased funding and resources for indigenous health, a reduction in the inequities accompanying globalisation, and constitutional and legislative changes by states.

Many indigenous groups have emphasised autonomy and self determination and have given priority to developing an indigenous health workforce that has both professional and cultural competence. They have also promoted the adoption of indigenous health perspectives, including spirituality, in conventional health services. Traditional healing has been suggested as a further strategy though generally as part of comprehensive primary health care and in collaboration with health professionals.<sup>12</sup> However, while access to quality health care is important, socio-economic and macropolitical interventions may have greater potential for improving the health status of indigenous peoples.

As the international decade for the world's indigenous peoples which began in 1994 moves towards its final year, a major theme of the third Asia Pacific Forum on Quality Improvement in Health Care to be held in New Zealand in September 2003, will be indigenous health issues especially as they apply to Maori and Pacific peoples. The *BMJ* will also publish a

theme issue on 9 August 2003 on the health of indigenous people from all over the world—not just New Zealand—and invites original research papers on the topic. Papers should be submitted to [www.submit.bmj.com](http://www.submit.bmj.com) and the editorial contact is Rajendra Kale ([rkale@bmj.com](mailto:rkale@bmj.com)). The guest editors will be Chris Cunningham and Fiona Stanley.

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## Neurocysticercosis

### *Eradication of cysticercosis is an attainable goal*

Neurocysticercosis is a disease of large proportions; in most developing countries, with the exception of the Muslim world, neurocysticercosis is by far the main cause of epilepsy with a late onset and of hydrocephalus in adults.<sup>1</sup> In the past 20 years two developments have drastically improved the gloomy picture that was associated with neurocysticercosis in the past: neuroimaging studies and the advent of effective cysticidal drugs. Computed tomography and magnetic resonance are now the cornerstone tools for diagnosing neurocysticercosis, and two drugs, albendazole and praziquantel, are inexpensive, effective cysticidals and are not toxic.<sup>2</sup> Pharmacological treatment is now widely accessible and effective even in cases of giant cysticerci or ventricular cysts, which used to be the exclusive domain of neurosurgery.<sup>3</sup>

However, a new paradox has emerged. Although drug treatment is inexpensive, neuroimaging is unaffordable for many patients in endemic areas. Immunodiagnostic tests using serum, which theoretically would represent a logical alternative for screening

and diagnosis, have been abandoned in many neurological centres because of their poor reliability.<sup>4</sup> Currently they are used mostly for epidemiological studies.<sup>5</sup> In a large proportion of patients with neurocysticercosis, the clinical picture—epilepsy in most instances—is due to granulomas or calcifications as permanent sequelae of cysticerci that have already been eliminated by the immune system of the patient.<sup>6</sup> In these patients immunodiagnostic tests are erratic, cysticidal treatment redundant, and many patients will require lengthy treatment for epilepsy.<sup>2</sup>

Neurocysticercosis offers interesting perspectives for research in immunology and parasitology. For example, humans are the only definitive hosts that harbour both forms of disease: intestinal colonisation with *Taenia solium* caused by the adult cestode and cysticercosis mainly in muscles, eye, and brain caused by the embryo. The resulting diseases represent an encounter between the most evolved mammal and the most evolved parasite; the consequence is an intricate pathology.<sup>1</sup> In immunocompetent hosts the response is

broadly different from one person to another. In one individual the immune response may be intense and eliminate the parasite expeditiously, whereas another might develop tolerance and the parasite can survive and grow for years without evidence of an adequate immune reaction. This variable response constitutes a puzzle that shows, on the side of the parasite, sophisticated mechanisms of evasion, and, on the side of the host, a highly variable degree of immunity to an elaborate infectious agent.

For epileptologists, the brain lesions secondary to neurocysticercosis constitute another source of information on the mechanisms of epileptic discharges. The fact that the cysticercus often nests in an epileptogenic area and that this lesion can easily be identified and delineated by neuroimaging makes neurocysticercosis a fair model for studies on localisation and spread of epileptic discharges.<sup>6</sup>

Cysticercosis is also placed in the middle of sociocultural studies related to poverty and ignorance.<sup>7</sup> Domestic pork breeding is not simply another form of livestock; several peculiarities make the subject more complicated. Wandering pigs are a common sight in destitute communities. In contrast to other flocks, pigs can be fed human faeces, are resistant to many adverse environmental conditions, reach a large body size early in life, and are easily domesticated. All these characteristics make the domestic breeding of pork convenient for the financial sustenance of impoverished communities. Additionally, the fact that these pigs are fed human waste brings about two additional advantages: the raising of these flocks is inexpensive, and the flocks are an effective way to dispose of sewage in areas without proper sanitation. Thus, the problem of wandering pigs, which constitute the link in the life cycle of taeniasis and cysticercosis in humans is not as easy to break by simple measures such as confiscating infected meat, recommending the use of appropriate, but costly, pork food, and sheltering of animals.

The most cost effective perspective for eradication of cysticercosis, as with many other diseases, is by education and public awareness of the real source of infection.<sup>1</sup> In endemic areas, when people are asked about the source of cysticercosis the immediate answer is that the disease is acquired by eating pork meat infected

with cysticerci; it is unusual to hear that the real source of cysticercosis for humans and for pigs is the ingestion of food contaminated with human faeces from *T solium* carriers; strict vegetarians might also be infected by this route. The ingestion of undercooked pork infected with cysticerci is the exclusive path to the development of intestinal taenia, which closes the life cycle of the parasite. This misinformation poses obstacles for cost effective preventive measures.

Eradication of cysticercosis, and its most feared manifestation, neurocysticercosis, is an attainable goal. In the 19th century cysticercosis was endemic in Germany, but the disease faded early in the 20th century when the life cycle of the parasite became known.<sup>8</sup> Public education and sanitary measures were the essential factors for its disappearance, which was accomplished long before the advent of modern medical diagnostic neuroimaging and effective cysticidal. Although the clinical picture has greatly improved recently the current figures for neurocysticercosis as the most frequent parasitic disease of the brain provide clear evidence that large groups of people are deprived of the most basic assets of social development.

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## Moving beyond single and dual diagnosis in general practice

*Many patients have multiple morbidities, and their needs have to be addressed*

The awkward phrase "multiple morbidity" describes the common predicament of the many patients who have more than one health problem. Such patients are disproportionately represented among populations that are socioeconomically deprived and elderly.<sup>1</sup> A socioeconomic gradient exists in the incidence and prevalence of almost all major categories of disease, meaning that individuals and families who are socioeconomically disadvantaged are at risk of a

compounding multiplicity of health and social problems.<sup>2</sup> This multiple morbidity, coupled with the fact that the population of the United Kingdom is ageing,<sup>3</sup> poses challenges to the delivery of effective health care that have received almost no official attention.

Examples from mental health show that provision of service in this field has been slow to move from single diagnosis to dual diagnosis.<sup>4</sup> Dual diagnosis applies to patients who have a mental health problem and

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