

PERSPECTIVES

Medical Provision in the Twenty-First Century

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On 21 November 2000, the United Kingdom's House of Lords Select Committee on Science and Technology published a report on Complementary and Alternative Medicine (CAM) in Britain in response to a growing demand for these therapies.

In light of significant advances in nuclear transfer experiments and its potential for treatment of trauma and a range of incurable and degenerative diseases (e.g., Parkinson's disease, stroke, and spinal cord injuries), the House of Lords voted on 22 January 2001, to permit human embryonic stem cell research.

Coincidentally, on 12 February 2001, the profile of the human genome was first published, presenting unique scientific opportunities that could alter the manner in which genetically complex human diseases are prevented or treated.

Herein lies the paradox in medical provision.

What impact could such scientific breakthroughs have on alternative medical practices, particularly herbal medicine, which has witnessed the biggest growth among alternative therapies with a current U.K. market estimated in the region of \$340.8 million per annum (Kingston, 2001)?

The appeal of herbal medicine and herbal supplements within the public health domain is well documented but is the concept of integrated medicine wholly unrealistic in the light of current scientific innovation and the enormous potential that it presents to medicine? The world is witnessing a technologic revolution and an explosion of scientific knowledge of amazing proportions. Advances in medical

science have surpassed our wildest expectations, posing new therapeutic possibilities that constantly challenge and redefine the parameters of medical ethics. Nowhere is this more apparent than in the new developments in the biomedical sciences such as the Human Genome Project (HGP) and stem cell therapy.

It may be difficult for herbalists to accept the applications of the latest medical breakthroughs readily, but it is essential that practitioners have knowledge of such developments for a number of reasons. For instance, an understanding of individual variation and disease susceptibility may benefit herbal therapeutic practice, particularly where the tailoring of herbal prescriptions to the individual patient is a crucial factor. This is made more pertinent when examining the effects of herbal remedies in different people, in addition to the concept of synergy of the active ingredients. To gain a full and accurate understanding of such scientific innovation could not only demonstrate the benefits of such techniques but could also clearly define the limitations and possibly any disadvantages that inadvertently favor herbal medicine. To be informed of treatment options that are available could improve understanding of patients' perception of new scientific innovation, thus enabling a clear recognition of patients' needs and appropriateness of treatment. Moreover, an increased awareness of the range of medical provision in the 21st century would give a clear indication of the context and framework in which herbal medicine is practiced. Although any future alliances between

orthodox medicine and herbalists may seem remote in light of recent developments in medical science, it highlights a need for greater cooperation and practical application of both forms of treatment strategies. However, coordinating any such liaison would certainly prompt a basic education and appreciation of philosophies, principles and practices.

STEM CELL THERAPY: PUBLIC OPINION AND CONTROVERSY

Much of the interest generated recently in medical progress has been paralleled by the growing appreciation of the power of stem cells. Their capacity for differentiation is such that they hold great promise for organ transplantation and with an ever-increasing proficiency in cloning technology, it is envisaged that the perennial problem of tissue rejection that has plagued this procedure can now finally be overcome. Evidently, the use of stem cells obtained at crucial stages of embryonic development is highly contentious, raising ethical and moral questions especially when embryos are developed *in vitro* with the sole purpose of stem cell research or therapy. Much of the debate rests on the origins of the embryos and the techniques used to produce them; much less for their purpose than the deliberate creation, manipulation, and subsequent destruction of human life.

Benefits of using less controversial sources of stem cells are currently being reviewed to address some of the concerns being raised. Storing stem cells taken from umbilical cord cells may be used later on in life; this has important implications in many of the childhood cancers, particularly leukemia. Possibilities also exist for replacing lost brain cells in degenerative diseases such as Parkinson's and Alzheimer's as well as restoring the damage caused by stroke; this is exciting at the very least (Barinaga, 2000).

THE CLONING DEBATE

The recent permission to allow research into human embryonic stem cells enables nuclear transfer experiments which utilises the same technique that produced Dolly the sheep, then Polly, her clone. This has inevitably caused

great concern, as it is in essence, only a step away from human cloning. Such "reproductive cloning" is strictly forbidden under the new guidelines for experimentation and it may be reassuring to know that the House of Lords Select Committee is holding an inquiry into the ethical implications of stem cell research. In fact the U.K.'s Secretary of State for Health, Alan Milburn, recently declared his objection to human cloning and has pledged to enforce legislation to prevent this ever happening.

OVERVIEW OF THE HUMAN GENOME PROJECT

As witnessed on so many occasions, the pace of scientific discovery and technologic development has often gone against the grain of nature, but no breakthrough in history has done this so dramatically as the deciphering of the "blueprint" for the human being or the collective task entitled the HGP. At its best, the HGP has been hailed as the single most important project in the biomedical sciences, predicted to have an unprecedented impact and long-lasting value for basic biology, biomedical research, biotechnology, and health care. At its worst, the implications of living through the most stunning information revolution may result in a widening gap between the rich and poor, further highlighting the potential for abuse of rights, reinforcing a blatant disregard for medical and social ethics, and perhaps even creating a genetic underclass subjected to social inequalities and deprivation.

Knowledge of gene sequence presents opportunities for an improved understanding of natural variation including levels of risk among individuals for a number of medically important diseases that have a genetic origin. A comprehensive awareness of the mechanistic interaction between genetic predisposition and its activation into a disease state, in addition to determining genetic variation and disease risk, may significantly alter the manner in which disease is prevented or treated. This has important implications for herbal medicine. Until such time however, it is difficult to predict the pace and direction in which knowledge of the human genome will affect the manner of our future existence. We may witness a "clone explo-

sion" within a decade or so, with individual differences, social and genetic diversity that are integral to the human race becoming obsolete.

The controversy generated by the HGP and stem cell therapy may seem reminiscent of the kind of public outcry and press coverage of *in vitro* fertilization (IVF) techniques when it was first introduced some 20 years ago. At the time, IVF represented a significant challenge to the frontiers of medicine. By modern technological standards and amid groundbreaking scientific breakthroughs, IVF may appear tame in comparison, but could its current level of public acceptance signal a similar pattern of acceptance for technological and medical revolutions of the 21st century? Despite groundbreaking scientific breakthroughs, it is relevant to emphasize the importance of environmental influences on mechanisms for gene expression and ostensibly, much depends on the management of new information.

THE SURVIVAL OF WESTERN HERBAL MEDICINE

In an age of unfathomable medical advances as demonstrated recently, it is important to reflect on the historic origins of medical science and remind ourselves that much of what passes for "modern" medicine today, is simply a refinement of ancient remedies. It is currently estimated that nearly 60% of the best-selling prescription drugs are of plant origin (Kingston, 2001). The ancient remedies of the shamans and witch doctors have found their way into modern scientific laboratories at the cutting edge of drug development and medical research. Compelling evidence of their phytopharmacologic efficacy, are being utilized in the fight to conquer some of the killer diseases of the civilized world: cancer, Alzheimer's, heart disease, among others. This has been further illustrated by recent reports of success in developing an anticancer drug, combretastatin, that has been designed using extracts of the African bush willow bark and radioactive antibodies. In another exciting development, possibilities of using an ingredient extracted from the South African Hoodia cactus plant as an appetite suppressant may be available in pill form within 3 years. This presents a new opportunity for the treat-

ment of obesity but also a thriving and profitable business as a slimming aid. Patenting rights however currently remains controversial.

The protocol for drug development in the 21st century after advances in medical sciences, will now be one of design rather than the traditional trial-and-error approach. Drugs designed through knowledge of gene profiling and using powerful supercomputers may be able to "home in on their targets like well-aimed arrows" (Elmer-De Witt, 2001) and may even render the use of plant medicines redundant. However, the increasing acceptance of alternative therapies directly challenges this very notion, not to mention the concept of synergy, which is a predominant feature of the philosophy of herbal medicine.

Even a cursory overview of their underlying principles reveals the true disparity between alternative and conventional medical practices, which is evident at all levels of the therapeutic approach. This underlines the real paradox between scientific advancement and the growing public demand for natural therapies. The very survival of Western herbal medicine may depend on this difference. Though modern medicine focuses on the design of "magic bullets," some people respond better to the combination of the active ingredients that are found in herbs, and while medical science remains revolutionary, there are a host of illnesses from depression to multiple sclerosis for which there is no magic bullet (Mackenzie, 2001).

RESPONDING TO PUBLIC DEMAND

With any medical innovation, legislation has often proved necessary to safeguard public interests and health. In an attempt to protect the public against unskilled and unscrupulous practitioners of alternative health care, the House of Lords Select Committee's report into the practice of CAM in Britain addresses some fundamental issues.

However, addressing the regulation issue of CAM therapies does not necessarily ensure their survival amidst the onslaught of medical breakthroughs. The question arises as to whether Western herbal medicine can survive with its limited resources given the market that it is up against. Will pharmaceutical companies

be eager to invest in research and development of herbal medicines in the absence of patent protection? Is it economically prudent to invest in the development of herbal remedies when the HGP and stem cell therapy presents greater treatment possibilities? These issues will dominate all future debates, but it is evident that in the context of medical treatment, human diversity plays a key role, and what works wonders for one person may do little for another. Medical thinking must change as much as relinquishing the habit of viewing one type of therapy as a "cure-all" for a health problem. There is surely a role for all types of treatment strategies, whether conventional or alternative.

REWORKING HERBAL MEDICINE PHILOSOPHY

The very survival of Western herbal medicine in a culture of scientific innovation requires fundamental reworking. Crucially, this would establish a clear philosophy that is reflected in training programmes currently offered. Attempts at raising the profile of alternative medicine in the United Kingdom (Rees and Weil, 2001) appear increasingly difficult in light of recent scientific developments in conventional medicine. It is, however, reassuring that orthodox views on diagnosis and treatment are gradually embracing the holistic philosophy that forms the basis of most CAM practices particularly those in Group 1 as designated by the House of Lords Select Committee. It is now recognized that CAM practices are no longer an obscure issue in medicine and with many medical schools and training programs in the Western world now including the teaching of CAM therapy principles it is a significant addition to health care provision.

MEDICAL PROVISION IN THE 21ST CENTURY

The future of medical provision may be such that there is a greater choice and diversity that encompasses conventional and alternative forms of treatment in the fight against disease

or even its prevention. Despite groundbreaking developments in science and technology, the advocates of natural therapies will argue that the power of nature is such that true alternatives to conventional forms of treatment are far superior, as is often expressed by the old adage: "new doesn't necessarily mean better."

HGP and stem cell therapy may revolutionize Western medicine but its assumed global dominance and impact may have its limitations that may only be fully realized after many years of its incorporation and application. In an age of greater global accountability, recognizing the differences in medical practices and respecting the traditions that have maintained the survival of ancient remedies and their therapeutic uses is paramount. Much is to be gained from enshrining and protecting legitimate diversity in medical practice, not so much for the purpose of scientific advancement but significantly, and more critically, for the benefit of mankind as a whole.

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