
The dangers and limitations of modern biomedical research

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I only went into medicine because I could not do arithmetic at school. I hated blood and guts and the saving of lives that seemed to dominate medicine, but soon found the safe backwater of rheumatology which I found rather easy. My academic career in that subject was interrupted by Saddam Hussein, after which I became confused and allowed myself to be made Dean of the Faculty of Medicine at Bristol. I was fantastically bad at that job but regained enough insight to resign from it after a couple of years. I then went into health services research. I don't really know what that means either, but it has allowed me to think about and research issues that I really mind about in healthcare, such as listening, caring and healing.

Summary

In its quest for acceptability, CAM is being inappropriately drawn down the biomedical research route. Biomedicine and biomedical research are only a small part of the answer to our healthcare needs and CAM practitioners should resist these moves. CAM works in a different way and that is what needs to be accepted.

Introduction

The Limits to Medicine was the title of an influential book written by Ivan Illich¹ in 1976. He argued that orthodox doctors did more harm than good. He highlighted the harm that many interventions cause (iatrogenesis), the lack of societal perspective of biomedicine and, most notably, the damaging effects of the extensive professional control that medical people have over the lives and health of others. (He referred to this as a form of direct aggression against individuals and as social iatrogenesis). This important book caused quite a stir for a while, but now it appears to be largely forgotten. Currently it seems that everyone believes in biomedicine and biomedical research: today you cannot open a newspaper without seeing a story about some wonderful 'breakthrough' being about to be

achieved by medical science, that will soon lead to the elimination of some common illness (these breakthroughs are usually for the future rather than the present, and most are never heard of again). Genetics, which has not lived up to the huge hype it was given, is slowly being replaced by stem cells as the great hope for the future, backed by massive government investments in all first world countries that are not put off by ethical concerns.

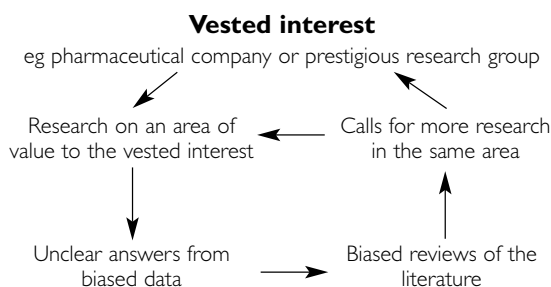
One of my concerns has been that biomedical research, like biomedicine, can be damaging. This can occur for three reasons:

- 1 The research agenda is controlled by vested interest groups who do research on what they want to know about rather than research that is in the best interests of patients or of society in general. This results in medical developments

that make money but are not what we have most need for, and to false beliefs as to what medical research can offer.

- 2 Research undertaken within one paradigm, if applied to things that work at a different level, will come to inappropriate conclusions. This I believe is particularly damaging to complementary and alternative medicine (CAM) which is currently being researched and found wanting by conventional scientific methods.
- 3 Bad research is worse than no research as it can lead to the promulgation of incorrect information. Much medical research is done badly, but ambitious authors of the work often make wild claims on the back of their invalid results. The recent problems with the MMR vaccine, now leading to unnecessary deaths and damage to children, is a good example.

The 'self-serving research cycle' dominates much biomedical research. It works like this:



There is only one place that such a cycle can lead you to – a dark posteriorly placed orifice – and many biomedical researchers are indeed up their own, doing very clever things to solve smaller and smaller aspects of a problem that only they think to be important (the ultimate in reductionist science).

Perhaps I exaggerate. Illich probably weakened his position by exaggerating the argument on the limitations of medicine, but he had a very important central point – there are limits to what medicine and its research base can achieve.

Why is modern biomedicine so dominant in health care?

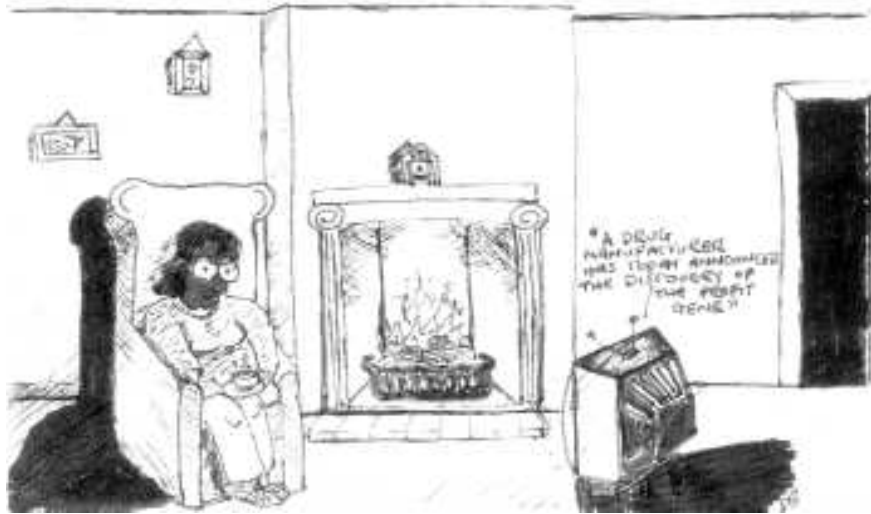
We live in a pluralist society, in need of pluralism in all walks of life, including healthcare. However, we

only have one accepted system for health – orthodox medicine based on the biomedical model. The obvious success that medical science had over infectious diseases in the 19th and 20th centuries helped push the biomedical agenda forwards, and as legislation was put into place to avoid problems with medical charlatans the system took hold. More recently, two other interrelated factors have helped to secure the dominant position of biomedicine – money and research.

There is lots of money to be made out of healthcare, not only by the medical men at the top of the biomedical tree, but also by commercial firms, particularly the pharmaceutical industry. Ever since the discovery of penicillin, and demonstration of the miraculous effects that it could have on previously fatal conditions like pneumonia, we have been increasingly seduced by the drug industry's rhetoric, and the belief that with the help of a little bit more (biomedical) research, we will be able to find 'a pill for every ill'. The policy has been successful in many ways. The number of drugs has increased enormously, many of them are very useful and, of course, the industry has grown and now makes huge profits. A proportion of those profits are ploughed into 'buying' the services of all the key opinion leaders in biomedicine and biomedical research, and of the press. The pharmaceutical industry is now in control of the research agenda, and, in a very real sense, of the cultural conditioning that leads most people to believe in future biomedical research as the long-term answer to all our health problems.

What is biomedicine good at?

Biomedicine is good at lots of things; it *is* a success story. Modern drugs or surgery can now treat many of the major diseases that affect us. Biomedicine has been particularly successful in the control of acute medical crises – pneumonia, heart attacks and appendicitis for example. And there will be further successes in the future. It seems likely that the control of disease processes like cancer will continue to improve, particularly in younger people, and that many other diseases will succumb to the biomedical revolution. But it is not the *whole* answer.



What is biomedicine bad at?

There are lots of health-related issues that biomedicine still has no answers for, and that it may never be able to cope with. In this article I want to highlight four interrelated aspects of ill-health that remain relatively untouched by biomedicine and biomedical research. They are:

- 1 **Age-related problems.**
- 2 **The illness experience (rather than the disease process).**
- 3 **Chronic health problems that do not fit the biomedical model.**
- 4 **The individualisation of healthcare.**

Age-related problems

Finding a pill or a cure for aging has been one of the goals of biomedical research (as well as of the beauty industry) for many years. How arrogant is that? How awful would it be if they succeeded? Fortunately, it does not seem likely that they will; let us hope that this is one aspect of biology that remains out of the control of the biomedical scientist. Western healthcare systems are dominated by caring for older people; as we get better at the control of malnutrition and infectious disease it is age-related disorders that become the biggest problem. And modern biomedicine has few answers to many of these problems. We can keep people alive for longer time periods than they would wish, we can reduce the burden of some symptoms, including pain, but we can do relatively

little for the basic ‘disease’ of being an older person in a society that does not seem to value ageing, and for the misery and ill-health that this brings to many people.

The illness experience

Doctors are obsessed with the diagnosis and treatment of disease (ie an ‘abnormality’ of the structure or function of the body). They pay scant attention to illness (ie the experience of the individual patient whose body and mind are not working harmoniously). And they mostly take little or no notice of the health beliefs of their patients. Rather, they try to impose the biomedical model upon them. So, for example, if a patient is in persistent pain (for instance because of osteoarthritis) and believes that this is due to an imbalance of energies within their body/mind/spirit, the doctor will generally ignore all of that, look for an organic cause for the pain and prescribe a drug designed to ‘kill’ it. Not surprisingly, that patient probably does not take the painkiller, risking retribution from the doctor and the judgmental label of ‘non-compliance’, given in the complete absence of any understanding of the illness experience and its interpretation by that individual.

Chronic health problems that do not fit the biomedical model

Huge numbers of people are afflicted by chronic health problems that make no sense to biomedicine. Doctors use a set of extraordinary expressions

to describe these, such as ‘medically unexplained symptoms’, ‘non-organic disease’ or ‘somatisation’. On the positive side, these expressions do at least recognise the failure to understand within the biomedical model. But implicit within them is mind–body dualism and a judgmental attitude towards those put into this category. Thus biomedicine tends to view symptoms that they cannot explain through disease as being potentially ‘all-in-the-mind’ and thus, in some strange way, not valid. Doctors tend to be dismissive of patients in whom they cannot find a disease to which they can apply one of their magic bullets.

The individualisation of healthcare

There is a constant tension in healthcare between the societal perspective and that of specific patients, between collectivism and individualism, between the desire to do the greatest good for the greatest number and the need to answer the individual problems of the patient in front of you (at the potential expense of everyone else). Biomedicine and its research base have not dealt adequately with this conflict (and neither, arguably, has anyone else including the complementary/alternative medicine community). Public health professionals point out that the determinants of poor health are socio-economic and that we will get more benefits from reducing the prevalence of poverty or obesity than we can ever get from genetics or stem cell research. But nobody takes any notice of that lobby, and the biomedical fraternity continues to develop expensive disease-based interventions that are only available to a few of the world’s people, and to behave, at a clinical level, as if the primacy of the individual was paramount. And there is another related problem – evidence based medicine.

Evidence based medicine and patient centred care

Two of the current government-supported fashions in healthcare, on which research is demanded, are for evidence based medicine and patient-centred healthcare. There is the potential for conflict between these two movements.

- *Evidence based medicine* uses data derived from the ‘average’ of large groups of selected people, and is of little direct relevance to individual practitioners and patients.
- *Patient-centred care* views everyone as different, and promotes individual primacy at the expense of evidence or societal perspectives.

Much of the more applied end of the biomedical research spectrum is spent on creating and then trying to disseminate the evidence base for evidence based medicine. This is done as follows:

- 1 Vested interest groups (see above) undertake trials to find out whether X works. These trials are often done on highly selected groups of patients, and generalisations cannot be drawn from the results. They usually show that X works.
- 2 Nerds try to synthesise the data from all available trials through the tricks of systematic reviewing and meta-analysis. This probably exaggerates the biases within the trials themselves, but they come out with numerical answers (such as the NNT: the number of people needed to treat to get one success from X).
- 3 Guidelines are written saying that because the NNT of X is Y, practitioners should always use it for condition Z.
- 4 All practicing physicians receive these guidelines and promptly throw them into the nearest waste receptacle.

So why do the physicians throw the guidelines away? Because they are meaningless to the individuals they see. They are based on averages of data collected from unrepresentative groups of patients and there is no average patient. Older people in particular are rarely included in the trials and usually have more than one health problem, making it impossible to apply these ‘clean’ guidelines to them. And yet, as pointed out already, older people dominate the group in need of treatment.

Complementary and alternative forms of medicine (CAM) are probably much better at individualisation than biomedicine, but they often fall into the trap of individual primacy at the expense of evidence and of the societal perspective. But CAM, while potentially able to help with individualisation and fill other gaps in healthcare

that are not answerable by biomedical approaches, is under threat.

The research-based threat to complementary and alternative medicine

Biomedicine and biomedical research are big businesses controlled by powerful people who have the ear of government. They will try to make sure that no-one else gets a look in, and they can play to current government obsessions with counting what can be counted and with accountability, as they dismiss other forms of healthcare. They have tried to marginalise all other paradigms (the pejorative term ‘complementary and alternative medicine’, a catch-all for every other type of approach, is evidence for this) but if they fail to marginalise one they will take it over by incorporating it into the biomedical model. This is already happening. The CAM community has been suckered into undertaking randomised controlled trials, using biomedical outcome measures, to prove that what they do is useless according to biomedicine. Similarly, CAM is allowing itself to be invaded by research to find out ‘how it works’ – again within a strictly biomedical model of cause and effect, with its inherent mind–body dualism.

This is dangerous; CAM practitioners are allowing biomedical researchers to prove that what they do is a waste of time – even when it is obviously valuable.

Resolving the conflict

I have presented a depressing scenario in which biomedicine and its research agenda control the world of healthcare in spite of the fact that they have a very uni-dimensional and restricted view of the world that cannot answer all our health-related problems. But I am not depressed about the future; pluralism will win out.

Many doctors believe that there is more to healthcare than biomedicine (although you have

to get them on their own to be sure that they will admit this, for in groups they close ranks). Many people in our society are similarly sure that there is more to life than molecules and genes.

The important thing, it seems to me, is to avoid the trap of allowing biomedical research to rubbish other approaches of value to people, which will result in the politicians getting rid of them through legislation. So CAM must stop doing RCTs with outcome measures based on biomedical thinking, and it must stop pretending that it can become accepted by the biomedical community. It works in a different way. Take, for example, homeopathy. As Peter Skrabenek points out², homeopathy involves dilutions that can go as low as 10^{-60} , a concentration that is equivalent to one grain of salt in the whole universe. No biomedical model is going to be able to deal with such a concept. But that does not mean that homeopathy does not work. If it does, it works in a different way and should not be subjected to the inappropriate rigours of chemistry and biomedicine: they are bound to find it wanting. If we must do research on it, we should try to find out why people value it and how it helps them, rather than waste effort asking how it works within the restricted biomedical model.

Biomedical research needs to learn humility.

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