Orthodoxy and credulity in medicine

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Abstract
Historically in medicine we have been quick to accept ideas based on inadequate evidence and quick to discredit those who question them. This is illustrated from the history of venesection and the work of Pierre Louis, from Pasteur's difficulties in getting physicians and surgeons to understand bacteria, from Jenner's work on vaccination, from the treatment of breast cancer, from the identification of the hazards of antenatal radiology, from the discovery of helicobacter pylori and from the recognition of the adverse effects of sugar. With the benefit of hindsight these controversies seem extraordinary. Some references to current issues are included. The difficulties outlined are not confined to medicine but have been well recognised in other disciplines.

Introduction

In 2016 a distinguished neuropathologist from Oxford, Dr Waney Squier, lost her medical license with the General Medical Council in the UK after allegations of giving misleading evidence as an expert witness. On appeal she was reinstated but with a continuing ban on medico-legal practice. Her academic work had led her to doubt the widely held opinion that a 'triad' of clinical findings (the 'shaken baby syndrome') could confidently be ascribed to child abuse. She had challenged the accepted wisdom of the time. For example, one High Court judge accused her of giving evidence 'contrary to the mainstream of current thinking' (1). This is a reminder that the persecution of those who hold minority opinions in medicine has a long and disreputable history.

Venesection

In the eighteenth and early nineteenth centuries the standard treatment for many disorders included bleeding and purging, the value of which was regarded as self-evident. The orthodox view was exemplified by a Dr William Gourlay who practiced in rural Scotland. In 1819 during an epidemic of fever (probably typhus) he complained that 'the existing prejudices among the lower classes prove the greatest obstacle to the efficient practice of the country surgeon; I found it no easy matter to persuade them to the necessity of losing blood for the cure of the fever. … At my first visit I found it necessary to bleed as a matter of course, and the flow of blood continued until syncope supervened' (2). With the benefit of hindsight the prejudices of the lower classes were justified. It is likely that bloodletting contributed to the death of George Washington at the age of 68 in 1799; it is estimated that 3.75 litres of blood were removed over about ten hours to treat respiratory distress (3). It was not until 1835 that the French physician, Pierre Louis, as a result of careful research, questioned the value of bleeding (3,4). He was heavily criticised at the time for depriving patients of this treatment.

Microbes

Louis Pasteur also fell foul of the French medical establishment in the nineteenth century for the novel opinion that bacteria caused infections (5). How could something so small affect a human being? At the time many diseases were attributed to local 'miasmas' or to personal vulnerabilities. Surgeons, operating in their blood- and pus-stained suits, dressed wounds with lint made from little-washed bed linen. Infected wounds were commonplace and pus was regarded as a good thing. One senior surgeon and politician, Armand Després (1834-1896), remained an advocate of soiled dressings to the end of his days. He openly expressed contempt for the methods of Pasteur and Lister and exclaimed: 'If the microbial doctrine is correct, why is it that wounds in the mouth, the most septic environment of all, always heal?' As late as 1883 another influential member of the Academy of Medicine, Michel Peter, turned to Pasteur in a discussion about typhoid and said: 'What do I care about your microbes? If you have seen one you have seen them all.'

Vaccination

One inspiration for Pasteur was the earlier work of Edward Jenner in England in demonstrating the effectiveness of vaccination. Jenner's first paper was submitted to the Royal Society in 1797 and rejected. He was told that his studies were incomplete, contained too many hypotheses and were likely to harm his reputation (5). He published his work privately at his own expense. Some physicians at the time 'found it intolerable to consider inoculating human beings with the impure humours of inferior creatures'.

Breast cancer

From the end of the nineteenth century the standard treatment of breast cancer was a radical mastectomy (6). In 1922 Geoffrey Keynes, a London surgeon, began treating early disease with local excision and radiation therapy. Over 70

percent of his patients survived five years, a respectable figure for the time. Later research and clinical trials gave ample support for this innovation but at the time he was heavily criticised. In his autobiography in 1981 (7) he commented: 'A built-in dogma of thirty years' standing died hard and I was regarded with grave disapproval and shaking of heads by the older surgeons of my own hospital.' In an earlier paper (8) he wrote: 'orthodoxy in surgery is like orthodoxy in other departments of the mind. It starts as a tentative belief in some particular course of action, but later …. comes to be held as a passionate belief in the absolute rightness of that particular view. A dissentient view is regarded as a criminal subversion of the truth, and the holder is sometimes exposed to slander and abuse. … In speaking today of the unorthodox view of treatment of cancer of the breast, I do not mean to suggest that orthodoxy has been manifested in its more violent forms. None of us has been burnt at the stake, but feelings have run pretty high.'

Antenatal X-rays

In the 1950s it became increasingly common to X-ray the abdomens of pregnant women to identify the position of their babies. Dr Alice Stewart of the social medicine department at Oxford published a survey that demonstrated that the children of mothers who had had this investigation were almost twice as likely to develop cancer as other children. This demonstration of the hazards of low doses of radiation was greeted with outrage by doctors and by the nuclear industry and she had difficulty in obtaining funding for her research. By the 1970s others had duplicated her research and antenatal radiology was discontinued (9)

Helicobacter

In 1983 Marshall and Warren in Western Australia reported the presence of curved bacilli in the stomach of patients with gastritis and peptic ulceration (10). Their suggestion that these might have an aetiological role was initially greeted with disbelief and derision (11). Everyone knew that peptic ulceration was caused by stress, hyperacidity, smoking and anti-inflammatory drugs. In any event the same bacilli were to be found in many people without ulcers. However it soon became clear that medication with antibiotics or with preparations of bismuth (a mild antacid but active antibacterial) was effective in curing many ulcer patients. These insights were surprising and medical practice was slow to change. In 1993 only 25 per cent of gastroenterologists in the UK were using antibacterial treatment as first-line therapy for duodenal ulcers and some did not use it at all. Marshall was exasperated by the inertia of his colleagues and asked why the National Health Service was still spending millions of pounds on acid-reducing drugs when he could cure peptic ulcers in two weeks for a pittance (11).

Sugar or fat?

Until very recently the orthodox view among nutritionists has been that the principal villain was saturated fat. This was regarded as a major cause of coronary heart disease. The frightening increase in the incidence of heart disease since the 1920s needed an explanation. The American nutritionist Ancel Keys proposed that to avoid heart disease we all had to limit our intake of red meat, cheese, butter and eggs. This widely accepted view was challenged by some, including the British nutritionist John Yudkin. He had found a clear correlation of the incidence of heart disease with the intake of sugar, not fat. Carbohydrates are converted in the liver to fat and deposited in adipose tissues and in blood vessels. Yudkin explored the issue in a book published in 1972, *Pure, White and Deadly*. In it he said, 'If only a small fraction of what we know about the effects of sugar were to be revealed in relation to any other material used as a food additive that material would promptly be banned'. This book was initially well received but later ignored in the face of criticism by Ancel Keys and many commercial interests. Yudkin died in 1995, largely forgotten. It is only since about 2009 that governments in

both the UK and US have recognised the dangers of sugar (12).

Fractures in children

I should declare an interest. Involvement with the Brittle Bone Society, the UK equivalent of the Osteogenesis Imperfecta Foundation, from 1972 onwards gave me an unrivalled opportunity to see patients with the various disorders that cause fractures in childhood. It also led to appeals for help from parents accused of child abuse after their children had been found to have unexplained fractures. Clear patterns emerged. Many of these children had large numbers of fractures but no bruises; it was difficult therefore to sustain the argument that the fractures resulted from inflicted injury. Bone diseases seemed much more likely (13). However a strongly held view had built up over the preceding thirty years that certain fractures of the ribs or of bone ends were highly specific for abuse and were unlikely to have another explanation (14). As a result of challenging such views I also faced a hearing before the General Medical Council. The GMC's prosecutor could not resist asserting that there were only two people in the entire universe who held my opinions. In 2004 I too lost my medical licence. We have since been able to publish many relevant papers in reputable peer-review journals (15 - 18). Others have reached similar conclusions (19).

The loss of medical registration did not affect me unduly since I had already retired after forty good years of medical practice. However it did discourage others from continuing this work and now parents of children with fractures, who are accused of abuse, find it almost impossible to obtain expert help in the UK. There is no doubt about the sincerity of those who claim that certain fractures can only result from abuse. They are convinced that they are rooting out an evil and protecting children. While no one wants to return children to abusive parents we must recognise that a false diagnosis of abuse does great harm to a family and not least the child in question.

Insights

In 1896 Leo Tolstoy wrote: 'I know that most men, including those at ease with problems of greatest complexity, can seldom accept even the simplest and most obvious truth if it be such as would oblige them to admit the falsity of conclusions which they have delighted in explaining to colleagues, which they have proudly taught to others, and which they have woven, thread by thread, into the fabric of their lives.' More recently the physicist Max Planck wrote bleakly: 'A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it' (20). Orthodox opinions when challenged are often defended energetically. In 1957 Sir Karl Popper commented: 'If we are uncritical we shall always find what we want; we shall look for, and find, confirmation and we shall look away from, and not see, whatever might be dangerous to our pet theories' (21). Mark Twain put this issue more succinctly 'It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so.' More recently US general George S Patton identified the same problem saying 'If everyone is thinking alike then somebody isn't thinking'. In medicine we should beware of resolutely hanging on to majority opinions not based on good evidence. We should cherish those, like Dr Squier, who question them.

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