

MEDICS REMAIN CREATIONISTS, OBLIVIOUS TO DARWIN

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Ten years ago, in a lecture to the Royal Society of Arts [published in their journal, 1999, 314: 101-7], I said “how disappointing and frustrating that so many clinical challenges have to pass from the GP to the local hospital, causing delay and inconvenience for patients and curtailing the scope of job satisfaction. In a well equipped veterinary practice diagnostic laboratories, X-rays, ultrasound are available at a single visit. There could be real benefits in small towns for some diagnostic facilities to be shared by doctors and vets, granted that the affordable quality of the equipment usually relates to the throughput. GPs might need extra training to interpret the results but information technology allows easy access to backup expertise- and what an increase in job satisfaction. A selection of medical students might benefit from a short stay in a first class veterinary practice to see the range of clinical skills deployed within a general practice setting and the combination of clinical and business acumen involved.”. The awful word polyclinic, redolent of out of season fruit and veg, had not yet appeared. “Human and veterinary medicine share startlingly similar problems. Our differences should educate us, not divide us. We should learn from our shared horizons and our different perspectives; the horizon is the point where differing perspectives finally converge”.

“The basis of comparative medicine is inescapable, imprinted in our destiny, inscribed in our genes; evolution gives us a shared legacy of biological mechanisms. We share our molecular ancestry and its disorders”. Unfortunately, many medics still regard humans as so different that no other species merits serious consideration; a startling blend of ignorance and arrogance. An offshoot is the mantra that veterinary research is inferior- indeed when I began in research, one of my mentors advised me to conceal my veterinary background. That was long ago but many medics have still not grasped that these days you are far more likely to meet medics who failed to get into veterinary school than a vet who is a thwarted medic. The cream of those inclined towards clinical studies, for several decades now, have been drawn to veterinary science rather than human medicine. Yet we still meet distinguished and influential medics who venture remarks like ‘I didn’t know dogs got geriatric problems; I did not realize that they lived long enough’. As a joke, it would be fairly feeble; the shocking thing is that the professor who said it thought it was profound.

Efforts to close the gap

Just over three years ago the British Medical Journal and the Veterinary Record published a joint edition [26.11.05] on comparative medicine, though sadly they did not call it that. A comparative approach is almost instinctive for veterinary surgeons- the study of diseases shared by different species [not just infections] and

the lessons to be drawn from the similarities and differences. Why, for example, do humans and cats with chronic renal failure commonly become hypertensive, whereas it is less usual in dogs ? Discussing comparative medicine over the cocktail sausages in a Cambridge College I was appalled to encounter a most distinguished and influential medical Professor who thought that it meant which diseases occurred in which country. I find this as crass as if he encountered an American vet who thought that hematology was the study of male diseases.

The concept of 'one medicine' is far from new, originating mainly with the nineteenth century realisation that normality and disease depended on similar mechanisms in humans and animals not only because their cells were similar, but also because the newly discovered micro-organisms affected both. Unfortunately, during the twentieth century comparative medicine lost its way, becoming equated with the creation, in laboratory rodents, of artificial models of human disease, rather than emphasising spontaneous models in domestic animals. What provides new impetus is the fact that molecular biology and genetics have converted it from studying animal diseases that merely resemble human diseases, to the knowledge that if the mediators, receptors and genes are the same we are looking at the same diseases in different species.

Why worry ?

Why does any of this matter; is it just ruffled feathers because my subject is Comparative Medicine ? I will give just three examples; inevitably they relate to my research because I understand them most thoroughly. Google or PubMed searches will find peer reviewed versions of the arguments.

1. Despite hypertension being one of the most expensive and easily remedied diseases afflicting the NHS, most doctors still measure blood pressure inadequately; usually a single reading, at any old time of day. Because non-invasive blood pressure measurement only reached veterinary medicine in the 1990s, the method had to be properly evaluated; readings should be related to time of day because there is a natural diurnal rhythm, the first [and with most GPs the only] reading is too unreliable to use [probably because the first inflation of the cuff seats it properly] and because, as has been known but ignored by medics for nearly 300 years, blood pressure is extremely variable; a series of at least five readings is needed. As shown in a leading human journal, the veterinary approach, applied to humans, reveals subtle but important differences in blood pressure which the routine human technique fails to demonstrate.

2. As the recent cholera tragedy in Zimbabwe reminds us yet again, this highly fatal disease is utterly treatable on principles initially identified within months of its arrival in Europe in 1831. It needs clean water and an effectively formulated oral rehydration solution. Unfortunately, the one favoured for humans by the WHO is almost certainly inferior to the best available for calves: too dilute to

properly restore circulating volume and correct severe acidosis, and without glutamine, unable to facilitate the recovery of villus architecture- especially important with patients who are already malnourished. The faith in excessively dilute ORS rests essentially on flawed evidence, flawed because in field situations it is often impossible to measure what really matters and unreliable proxies are used instead. It would have been possible for WHO to test the veterinary solution in an appropriate field situation where measures of plasma sodium would almost certainly have confirmed that hypernatraemia is a fear based on misunderstanding of the fundamental pathophysiology [Res. Vet. Sci., 2005, 79: 177-81]. Instead, WHO preferred to defend its entrenched position with a promise of relevant evidence regarding this risk; supposedly 'in press' it has never been sent despite reminders, nor is its existence revealed, nearly 3 years later, by searches of the relevant literature. 'Calves must be different' is the comfort blanket- whereas, unlike adult cattle, they are probably an excellent model for neonatal diarrhea and how to reduce its still huge mortality in children

3. There is now grudging, belated but welcome recognition that the prevalence of human hypertension can be reduced by cutting salt intake, especially the concealed intake in processed foods [equivalent to passive smoking]; this remains the main source of sodium for most of us. Debates have focused on 'customary' intakes and their effects, because in humans, unlike animals, it is difficult to measure the physiological requirement for sodium. Studies in mammals, from rats to sheep to cattle, show clearly that even now the target reductions of intake remain far above the physiological requirement of other mammals. Either human salt intake remains far too high or humans have a unique defect, compared with other mammals, in their ability to retain sodium when necessary [the usual everyday problem being sufficient excretion of excess dietary salt]: no such defect is known.

Uphill, but still the right direction

The year 2008 did bring a glimmer of encouragement. In Practice [July, 30: 408-11] described a hugely laudable project by a Welsh practice which hosted a final year medical student for 2 months. The amazing thing [not really, considering what I have already said] is that it took a veterinary practice rather than a medical school or a charity interested in innovation in medical education to do this, yet it is the medics who have most to gain. Not least, in my view, since 'euthanasia' for many still equates with awful things they saw done to laboratory animals in their long-distant practical classes. We really need a significant number of medics to see it done well, both in the surgery and at home, to try and undermine their reflex 'Hippocratic' objection and consider the real needs of their patients and the choices which they may very rationally make. I recommend that article to all those who missed it but someone with clout needs to identify how to make such experience part of the education of an influential minority of medics.

More broadly, medics need to understand that humans were not uniquely created, they evolved, therefore there are useful lessons to be drawn from other species. But the benefits of comparative medicine, traditionally focused on disease research, now extend to healthcare delivery. That same BMJ included a letter from the USA saying that “doctors responses to the present day sophistication of veterinary medicine can sometimes border on the condescending...perhaps medical and veterinary schools should facilitate combined programmes for certain motivated individuals”. Most owners of companion animals envy the service which their pets get from what is really very similar to a polyclinic, and above all, the sensitive and merciful way in which vets are able to handle end-of –life issues when clinical algorithms and palliative care can no longer suffice to avoid suffering. We are too shy about the potential relevance of our experience; short-stay surgery has long been a necessary part of routine veterinary practice, with excellent results. Once it would have been regarded by human surgeons as a sign of second-rate care - until economics and the dire risks of hospital acquired infections installed it in mainstream human clinical care.