Holiday parasites and furry friends

by HANNAH BRADBY AND BETH MAINA AHLBERG Feb 7, 2014

What did you bring back from your last holiday? Some happy memories, a sun-tan or perhaps something more exotic? A parasite? A stray dog? Both? Seventy-five per-cent of new human diseases are zoonotic. Concern for human public health means monitoring and treating animals too: as Rudolf Virchow noted, veterinarian and human medicine are not separate practices. Anyone who has pulled ticks from their skin, while worrying about Lyme’s disease can attest to this. In this context, ‘companion animals’ can be regarded as potential parasite reservoirs, and therefore big business. Treating parasites in domestic pets is a lucrative and growing market, with significant ongoing investment in developing new compounds to treat fleas, ticks and worms.

From a public health context, there are some worrying trends. Northern Europeans are not satisfied with lavishing products upon their local dogs; every year holidaymakers bring home dogs and sometimes cats that they have encountered on holiday and that are apparently abandoned or sick. This international movement of domestic animals has consequences for human and animal populations alike, in terms of vector parasites and the pathogens that they transmit to humans. Leishmania is distributed around the Mediterranean Sea and transmitted by the sand fly. The sand fly’s primary host is the dog from which it takes a blood meal thereby infecting it. Humans are secondary hosts and can also become infected, resulting in significant morbidity but not mortality.

Leishmaniosis as a disease has been introduced to northern climes via dog-import programmes and animal welfare programmes which ‘rescue’ neglected dogs en mass from southern Europe. Other methods of importing Leishmaniosis are tourists who buy bargain pedigree dogs while on holiday and those who take their dogs on holiday with them. Dogs are being ‘rescued’ not just from southern Europe, but also from holiday locations such as Brazil and Vietnam. More and more incidences of Leishmaniosis are being seen in Northern European countries where no sand fly vectors exist for its transmission. Worryingly, there is no legislation to control the movements of dogs from Southern to Northern Europe: indeed, the Schengen treaty means that animals are guaranteed freedom of movement as a type of ‘good’.

This trend raises interesting questions about how Leishmaniosis will behave in Northern countries. It is not yet clear whether an infected dog can transmit the disease in the absence of the insect vector. There are individual cases of humans and dogs that have never been in an endemic area, but have been in contact with animals that are positively infected and have, eventually, become infected. Whilst clear evidence of cross infection is lacking, the potential exists for Leishmaniosis to infect other dogs and even children who play with dogs, without having visited endemic areas.
While there is significant interest in Leishmaniosis as a human-domestic animal problem for which a market exists, another parasite that is epidemic in parts of Africa, has attracted no R&D activity from big Pharma. Tunga penetrans or tungiasis, colloquially known as jiggers or chigoe, affects humans and various animals including pigs, goats, cats and rats. This parasite directly infects both animals and humans via its vector, the sand flea and disproportionately affects rural areas where people share living space with livestock. Unlike the sand fly, the sand flea needs dry, warm sand in which to breed. So, in east Africa where jiggers is epidemic, the distribution is locally variable, depending on the type of soil. In Brazil pigs penned in muddy sties do not have jiggers, but those that roam and sleep on sandy soil are infected.

Jiggers is not a priority concern for the World Health Organisation because it has low to no mortality in humans. This is despite significant levels of morbidity (especially deformity of the feet) which undoubtedly makes jiggers a serious public health issue in affected localities. For humans, prevalence is high in children, drops in working age adults and rises again in the elderly. Untreated, it can make walking impossible and so interfere with schooling, farming and social contact. Its symptoms are highly stigmatised, as they are assumed to arise from a lack of hygiene and from poverty or in some cases from a belief in a powerful curse.

There are also clear economic effects. Livestock often bite at the area affected by the parasite, damaging their own flesh. Female pigs' teats can be affected, making feeding impossible so piglets die, with devastating effects on the human family economy. In Northern Uganda, where poverty combines with political instability, livestock is brought into homes for safe-keeping over night, which results in the dirt floors being re-seeded with flea eggs, so resident humans are re-infected.

The sand flea cannot be affected by insecticides as its mouth-parts are inside the host's body. Nonetheless, jiggers can be tackled in a community of animal and people. For instance through diagnostic monitoring and strategic prevention in animal reservoirs: by giving dogs and cats long-acting insecticidal collars and the repeated treatment of pigs with pyrethroid based products. School children's infections could be treated using topical oil, plus picking out fleas with clean pins.

However, there is not single fix-all product that a pharmaceutical company could develop, so the problem is not likely to be addressed for commercial reasons. Additionally, and importantly, an effective pharmacological solution would not help the shame and stigma of jiggers that individuals and families feel. If jiggers could be reframed as a public health problem pertaining to populations, some of this might be alleviated. At present politicians only attend to jiggers only when they need people to walk to the polling booth at election time. Elsewhere, the prosecution of individuals who are seen to have jiggers is a proposed prevention strategy.

Blaming the poor for their health problems is nothing new, nor is the sad spectacle of preventable problems persisting because of impoverished circumstances and a lack of 'commercial opportunity'. In a globalised world where profit determines the research and development agenda, we should not be surprised that the effects of sand flies on dogs should attract more interest than sand fleas' effects on humans and their livestock. But we can nonetheless deplore it.

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