

Medical History

## A SHORT HISTORY OF OCCUPATIONAL DISEASE: 3. LEISURE CAN MAKE YOU SICK

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### ABSTRACT

The risk of infection associated with occupations can, and does, extend to certain leisure and sports activities. Generally, such pastimes are regarded as important for human health and mental wellbeing. However, infections may, rarely, be acquired during leisure activities that include water sports and water-related relaxation, and certain sports.

### INTRODUCTION

It is well known that certain diseases are associated with particular occupations or activities. It is only in relatively recent history that the cause of many of these conditions was understood, and methods of spread and their prevention or avoidance were developed. This paper endeavours to provide an overview of occupational infectious diseases that are particularly associated with certain leisure and sports activities.

### DISEASES ACQUIRED DURING LEISURE ACTIVITIES

Generally regarded as important for human health and mental wellbeing, leisure and sports activities are an increasingly important aspect of life. However, infections may, rarely, be acquired during such activities.

### WATER-RELATED INFECTIONS

Water has long been recognised as an important vehicle for the spread of infection and contact with it may present high risk. Ancient Egyptians used copper vessels to store water to keep it fresh and free from contamination. Infections associated with swimming pools, water parks, water play areas, spas and aquaria, as well as lakes, rivers and the sea have all been described.

Inadequate chlorination of the water in swimming pools coupled with poor hygiene on the part of some users have resulted in infection with *Cryptosporidium*, *Giardia*, *Shigella* spp., *E. coli*, norovirus, polio virus, ringworm and verrucas. *Pseudomonas aeruginosa* contracted in the pool has given rise to 'swimmer's ear' and the use of inflatables and water slides have given rise to *Pseudomonas* folliculitis as a result of inadequate cleaning.

Sea water bathing can also lead to infections with halophilic *Vibrio* species. *V. alginolyticus* has caused severe swimmer's ear', and wounds contracted on beaches have become infected with *V. alginolyticus* and *V. vulnificus*, the latter causing severe infection.

With jacuzzis, footbaths and spas, poor hygiene (particularly

inadequate cleaning of their drains leaving as it does a reservoir of organisms) is the major factor associated with infections resulting from the use of these devices. *Pseudomonas* folliculitis, skin infections, infection with *Staphylococcus aureus* and other organisms have occurred. Although rare, cases of Legionnaire's disease have been associated with jacuzzis. Outbreaks of Legionnaires' disease and Pontiac fever have also been associated with spas.

Infections resulting from the use of Garra Rufa fish to give so-called 'fish pedicures' (Figure 1) include *Mycobacterium marinum*, *M. fortuitum* and *M. intermedium*. Cellulitis, loss of nails and toes have been reported.



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**Figure 1** So-called fish pedicures using Garra Rufa fish have resulted in *Mycobacterium marinum*, *M. fortuitum* and *M. intermedium* infections.

*Mycobacterium marinum* (previously known as *M. balnei*) was first isolated from a fish tank in 1926 and is now recognised as an occupational hazard for pet shop workers and keepers of aquaria. It was first described as causing infection in humans in 1951 when large outbreaks occurred in badly maintained swimming pools. In 1962, infection with this organism was recognised as being associated with fish tanks, and the condition was called fish tank granuloma.<sup>1</sup> Lesions appear on the hands and cooler parts the body. Marine

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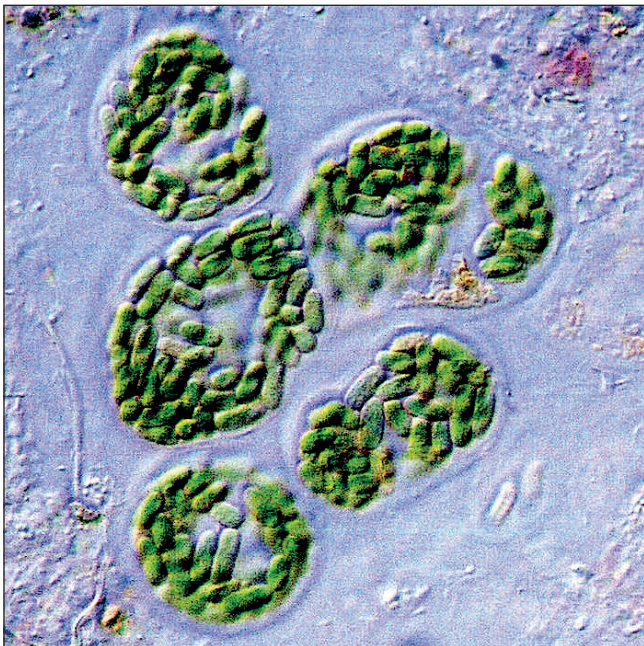
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biologists and professional fisherman are also at risk.

Recreation waters present risks to canoeists and rowers. Leptospirosis (pretibial fever and especially the severe form, Weil's disease) is an ever-present risk especially where the environment is contaminated with urine from rodents. Hepatitis A and enteroviruses including polio as well as norovirus have all been reported. Bacterial gastrointestinal infections have been reported following contamination with raw sewage and in tropical waters schistosomiasis should be considered.

The toxins from blooms of cyanobacteria (Figure 2), produced in warm weather, can cause eye irritation, dermatitis, joint and muscle pain, and, more seriously, gastroenteritis, pneumonia, liver damage and certain neurological conditions. Amoebic dysentery and amoebic meningitis have also been associated with warm waters.<sup>2</sup>



**Figure 2** The toxins from blooms of cyanobacteria, produced in warm weather, can cause a range of problems, from eye irritation to liver damage and certain neurological conditions.

### INFECTIONS RELATED TO SOME OTHER SPORTS AND PASTIMES

Herpes gladiatorum (scrum pox) was first described in the 1960s. It is caused by herpes simplex type 1 virus although infections with type 2 may also occur. It is mostly associated with contact sports such as rugby (scrum pox) (Figure 3) and wrestling (wrestler's herpes or mat pox). In 1991 a large outbreak of wrestler's herpes occurred among high school wrestlers, with 60 out of 175 affected developing lesions on the head (73%), extremities (42%) and trunk (28%).<sup>3</sup>

Other infections recorded include impetigo (*Staphylococcus aureus*, *Streptococcus pyogenes*), ringworm due to *Trichophyton tonsurans*, and viral infections such as chickenpox from cases of shingles.



**Figure 3** Herpes gladiatorum was first described in the 1960s, and is mostly associated with contact sports such as rugby and wrestling.

Athletes are at particular risk of pitted keratolysis, a skin infection associated with pit formations on the soles of the feet. The causative organisms have been identified as various corynebacteria, *Dermatophilus* spp., *Kytococcus* spp., *Actinomyces* spp. and *Streptomyces* spp.

Hill walkers and climbers are prone to infections of the feet following long periods in the wet, or damage caused by blisters and wounds.

Dermatophyte infections (athlete's foot) are common, but bacterial infections less so. Lyme disease may be a risk in areas where deer are present, and camping in areas where cattle faeces poses the small risk of infection with *Escherichia coli* O157.

### CONCLUSIONS

Many occupations and pastimes are now recognised as being hazardous, but not all of the hazards were immediately obvious. It has often required outbreaks or an accumulation of many cases before the dangers are identified, and the necessary control measures put in place. Recreational activities have been shown to have specific risks or be associated with certain illnesses. From the use of jacuzzis, footbaths and spas to the appearance of herpetic rashes in wrestlers, we are now more aware of the dangers inherent in certain leisure and sporting pastimes, and how to regulate and minimise the risks.

*This article is based on, and expands, the subject of the IBMS History Committee posters exhibited at the Biomedical Science Congress, held at the International Convention Centre, Birmingham, in September 2019. The five posters may be viewed and downloaded as PDF files from the IBMS website ([www.ibms.org/historyposters/occupational\\_health/](http://www.ibms.org/historyposters/occupational_health/)).*

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