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Commentary

Transmission Path of Rabies Virus in Cenral Nervous System and it's Control

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DESCRIPTION

The most common method of rabies transmission is through the percutaneous bite of a mammal that is carrying the virus in its saliva. Although less commonly than bites, nonbite exposures including scratches and licks can also cause rabies infection. Transmission may also happen when extremely concentrated aerosolized virus particles are inhaled under unusual circumstances. Either direct inoculation into peripheral nerves or infection of nearby tissue (such muscle cells), followed by nerve entrance at the neuromuscular junction, are two ways to get access to the nervous system.

The rabies virus invades peripheral nerves before travelling retrogradely into the Central Nervous System (CNS). Viral amplification causes the virus to spread quickly in the rostral grey matter of the spinal cord after the virus has infected the ventral horn of the spinal cord and/or the dorsal root ganglia. Axoplasmic transport is used to advance material to the brain along a number of ascending and descending fibre routes, where it is first placed in the brainstem and then diffuses retrogradely into the rest of the brain. In contrast to necrosis or apoptosis, the resulting neurologic symptoms are thought to be predominantly the result of nerve cell malfunction; however, the precise functional impairment involved is unknown.

Viral particles can exit the body and enter a new host through viral migration from the brain onto peripheral areas like the salivary glands. The face and glossopharyngeal cranial nerves transmit virus to the salivary glands *via* their associated ganglia after infecting the brainstem nuclei. Significant amounts of virus are shed into salivary secretions as a result of subsequent infection of glandular epithelia. Additionally, viruses are sent to the cornea and retina of the eye as well as to the heart, kidneys, liver, and other parasympathetic and sympathetically mediated organs and tissues.

In 2004, four individuals developed rabies after receiving transplanted tissue from an organ donor who was rabies-infected but had not yet been detected. This incident illustrated the iatrogenic ramifications of the latter event. It has also happened on numerous occasions for corneal transplants to transmit rabies. As a standard diagnostic specimen, a skin biopsy sample from the nuchal tactile hair is used because the virus frequently collects in these free sensory nerve terminals.

It is erroneous to assume that contact rate scales with host density and to disregard the richness and diversity of animal and human behaviour. Evidence of the ineffectiveness of culling to control rabies reflects this.

The vast majority of free-roaming dogs in most societies throughout the world are owned and in reasonable health, thus killing these animals is ethically dubious. Nevertheless, culling can lower the number of dogs to be vaccinated to attain herd immunity (although not the proportion). Thus, culling can have unforeseen negative effects for the population that frequently cause significant upheaval, whereas such dogs can typically be vaccinated without experiencing any of these unfavourable effects.

CONCLUSION

Although it has been demonstrated that consuming the meat of experimentally infected animals can transmit rabies to humans, such cases are incredibly rare. However, the risk from killing and preparing meat from a rabid animal is likely higher and in certain documented cases cannot be ignored as the possible route of transmission. Human rabies cases from ingestion of rabid animals have been reported.

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