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A Brief Note on Study of Leporipovirus-Myxoma

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Editorial Note

Myxomatosis is caused by the Myxoma virus, a poxvirus belongs to the Leporipoxvirus genus. Tapeti (*Sylvilagus brasiliensis*) in South and Central America and brush rabbits (*Sylvilagus bachmani*) in North America are the natural hosts. In these species, the myxoma virus causes only a mild disease, while in European rabbits, it causes a severe and frequently fatal disease (*Oryctolagus cuniculus*).

Myxomatosis is a perfect example of what happens when a virus transfers from an adapted host to a naive host, and it's been studied extensively because of it. In the 1950s, the virus was deliberately introduced to suppress wild European rabbit populations in Australia, France, and Chile. Myxoma virus belongs to the Leporipoxvirus genus (family Poxviridae; subfamily Chordopoxvirinae). Myxoma viruses, like other poxviruses, are enormous DNA viruses having double-stranded DNA which is linear.

Virus replication occurs in the cell's cytoplasm. Tapeti (*Sylvilagus brasiliensis*) in South and Central America and brush rabbits (*Sylvilagus bachmani*) in North America are the natural hosts. In these species, the myxoma virus causes only a minor disease with just the production of skin nodules as a symptom. The myxoma virus causes a severe and often fatal disease in European rabbits known as myxomatosis.

There are several strains with varying degrees of pathogenicity. The Californian strain, which is found only on the west coast of the United States and in Baja, Mexico, is the most dangerous, with 100%case fatality rates reported. The South American strain, which can be found in South and Central America, is significantly less virulent, with case fatality rates of 99.8%. Strains seen in Europe and Australia have weakened, with case fatality rates ranging from 50 to 95%. While wild rabbits in Europe and Australia have developed some resistance to the virus, this is not always the case with domestic rabbits.

The clinical presentation of myxomatosis in European rabbits is frequently used to diagnose the disease. A number of laboratory tests are available if a rabbit dies without presenting the usual symptoms of myxomatosis, or if further confirmation is required. Histopathology, electron microscopy, and virus isolation have all been used in the past. Undifferentiated mesenchymal cells within a matrix of mucus, inflammatory cells, and edoema are common histopathologic findings in afflicted skin. In the epidermis and conjunctival epithelium, intracytoplasmic inclusions can be detected. Due to the large size and different structure of poxviruses, negative-stain electron microscopic examination can also be performed for diagnosis. This approach enables for quick viewing of poxviruses, however it does not allow for specific viral species or variant verification. Virus isolation is still the "gold standard" against which all other virus detection procedures are measured.

At the very least, a single live virus found in a specimen can be grown in cultured cells, allowing for more extensive characterisation. Myxoma virus identification has been faster and more accurate thanks to recent development of molecular technologies such as polymerase chain reaction (PCR) and real-time polymerase chain reaction assays. Real-time PCR makes it very easy to diagnose myxomatosis by allowing swabs from the nose, eyes, or genital area to be examined fast.

It can also be used to confirm the presence of Myxoma virus and identify the viral strain in paraffin-embedded tissue samples. In some places, myxomatosis vaccines are available. All are cross-immunity modified live vaccines based on attenuated myxoma viral strains or the closely related Shope fibroma virus. Because the virus can be carried inside by vectors or fomites, it is suggested that all rabbits in locations where myxomatosis is endemic be routinely vaccinated, even if maintained indoors. Vaccination in the event of an outbreak is useful in lowering morbidity and mortality in group conditions where rabbits are not consistently immunised. Because the vaccine does not provide complete protection, it is still necessary to avoid contact with wild rabbits and insect vectors.

To stay effective, myxomatosis immunizations must be boosted on a regular basis, and annual injections are commonly suggested. Nobivac Myxo-RHD, a bivalent vectored vaccination that protects against both myxomatosis and rabbit haemorrhagic disease, is marketed in Europe and the United Kingdom. Rabbits 5 weeks of age and older can be immunized with this vaccine, which takes around 3 weeks to produce immunity. Myxomatosis and rabbit hemorrhagic disease immunity lasts for 12 months, and annual immunisation is needed to maintain protection. The vaccine has been found to lower myxomatosis mortality and clinical symptoms.

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