



Herpesviruses in Hedgehogs

Agent

Herpesviruses are found in many different animal species. The herpesviruses that infect warm blooded animals belong to the family *Herpesviridae*, which is divided into three subfamilies: alpha-, beta- and gammaherpesviruses. Most herpesviruses are species specific (*i.e.* they can only infect one species) but some are known to be able to infect multiple species.

Viruses belonging to two subfamilies of *Herpesviridae* have been shown to infect Western European hedgehogs (*Erinaceus europaeus*): in Great Britain, at least two gammaherpesviruses have been identified, whereas in Sweden and Switzerland, an alphaherpesvirus called *Human alphaherpesvirus 1* (the most common causative agent of human cold sores) has been confirmed in two hedgehogs, one animal from each country. *Human alphaherpesvirus 1* is very common in people worldwide but it has so far not been identified in the British hedgehog population.

Signs of disease

To date there is no evidence that British hedgehogs infected with a gammaherpesvirus suffer disease: instead it appears that they may be 'asymptomatic' carriers of the virus. Whether these viruses have the potential to cause disease in some individuals requires further investigation.

There have only been two cases of hedgehogs confirmed to be infected with *Human alphaherpesvirus 1* to date, both in mainland Europe, but these infections were linked to severe liver or neurological disease in these hedgehogs.

Disease transmission

The route of transmission for hedgehog gammaherpesvirus infection is currently unknown. However, herpesviruses are known to be transmitted via body fluids (e.g. saliva) and generally infect their host for life, meaning once infected the host will never get rid of the infection. Herpesviruses can become latent over long periods of time, whereby they remain present within the body, evading the host's immune system and not replicating. During these latent periods, the virus cannot be transmitted but reactivation and replication can start again when trigger factors affect the body (e.g. stress, concurrent disease, immunosuppression or hormonal changes).

With regards to the hedgehogs infected with *Human alphaherpesvirus 1*, both had been in wildlife rehabilitation centres and it is possible that these hedgehogs contracted the infection via direct or indirect contact with a person with an active cold sore.

Distribution

Gammaherpesvirus infection occurs widely in hedgehogs in Great Britain. A recent study of samples collected from British hedgehogs examined post mortem found that approximately half tested positive for at least one of the two identified gammaherpesviruses. In all cases, the hedgehogs examined had died from causes unrelated to gammaherpesvirus infection.

Human alphaherpesvirus 1 is very common in people worldwide but is believed to be a rare cause of disease in hedgehogs.

Risk to human health

There is no known threat to public health from the gammaherpesviruses identified in British hedgehogs.

Human alphaherpesvirus 1 is a very common infection in people and is typically contracted from contact with other infected people. This virus has not been detected in hedgehogs in Great Britain to date, however sensible hygiene precautions are advised as a routine measure when handling these animals (see *Prevention* below).

Risk to domestic animal health

There have not been any reports of domestic animals becoming infected with any type of herpesvirus from hedgehogs.

Diagnosis

Diagnosing a herpesvirus infection in hedgehogs requires specialist laboratory testing. To date, herpesviruses have only been confirmed in hedgehogs examined post mortem, using molecular tests (i.e. polymerase chain reaction), electron microscopy and/or virus isolation.

If you wish to report finding a dead hedgehog, or signs of illness in a hedgehog, please visit www.gardenwildlifehealth.org. Alternatively, if you have further queries or have no internet access, please call the **Garden Wildlife Health** vets on **0207 449 6685**.

Control

Whilst some antiviral medicines are available to treat domestic animals, effective and targeted dosing of free-living hedgehogs is not possible.

Suitable commercial products, such as disinfectants, should be used to clean and disinfect equipment and contaminated surfaces. When disinfectants are used, please follow the manufacturer's instructions.

While reporting sick animals to **Garden Wildlife Health** helps us to build up a picture of hedgehog health across Great Britain, we cannot advise on the treatment of sick animals. If you find a sick hedgehog, therefore, you should contact

your nearest veterinary surgery or wildlife rehabilitation centre for further advice and use sensible hygiene precautions when handling the animal (see *Prevention* below).

Prevention

Hedgehogs in the wild

Although little can be done to prevent the spread of herpesviruses amongst hedgehogs in the wild, the disinfection of any bowls or plates used to feed wild hedgehogs should be routinely carried out as follows:

- Clean surfaces, bowls or plates using a suitable disinfectant (for example, a weak solution of domestic bleach (5% sodium hypochlorite) or other product following the manufacturer's instructions). Always rinse thoroughly and air-dry before re-use.
- Brushes and cleaning equipment should not be used for other purposes and should not be brought into the house, but be kept and used outside and away from food preparation areas.
- Wear rubber gloves and thoroughly wash hands and forearms afterwards with soap and water, especially before eating or drinking.

If you need to handle a hedgehog please use thick gardening or rubber gloves and wash your hands thoroughly with warm water and soap afterwards.

Hedgehogs in rehabilitation centres

Hedgehog rehabilitators should practice good biosecurity as a routine to minimise the likelihood of disease transmission in captivity. It is important to minimise the risk of hedgehogs in care contracting infections from human carers that could then unwittingly be released into the wild hedgehog population with unknown potential adverse impacts. If a hedgehog carer has an active cold sore lesion, it is advisable to either avoid working with hedgehogs as a temporary measure, or to wear a face mask to minimise the risk of virus transmission from the person to the hedgehog.

Further information

More advice on hedgehogs in your garden can be found on the Garden Wildlife Health website www.gardenwildlifehealth.org

Scientific publications

Widén, F., Gavier-Widén, D., Nikiila, T. and Mörner, T. (1996) Fatal herpesvirus infection in a hedgehog (*Erinaceus europaeus*). *Veterinary Record* **139**: 237-238. <http://dx.doi.org/10.1136/vr.139.10.237>

Labrut, S., Hoby, S., Kappeler, A., Ryser, M.-P. and Robert, N. (2006) Fatal herpesvirus encephalitis in a Hedgehog (*Erinaceus europaeus*). In Proceedings of the 6th scientific meeting, European Association of Zoo- and Wildlife Veterinarians (EAZWV), Budapest, Hungary, 24–28 May, 261-262.

Hydeskov, H.B., Dastjerdi, A., Hopkins, K.P., Ryser-Degiorgis, M.-P., Widén, F., Cunningham, A.A. and Lawson, B. (2018) Detection and characterisation of multiple herpesviruses in free-living Western European hedgehogs (*Erinaceus europaeus*). *Scientific Reports* <https://doi.org/10.1038/s41598-018-31900-w>

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