



Avian paramyxovirus type 1 in pigeons

Guidelines for veterinary practitioners

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Avian paramyxovirus type 1 in pigeons

Avian paramyxovirus type 1 was first detected in Australia in August 2011 and appears to have become established in Victoria. Since May 2012, it has also been confirmed in flocks in New South Wales. It is likely to spread from Victoria and New South Wales to eventually affect pigeons in Queensland.

Veterinary practitioners may be consulted by pigeon owners to investigate clinical disease, prescribe Newcastle disease vaccine, or provide advice on preventative biosecurity precautions.

The virus

Paramyxoviridae is a family of viruses that causes a number of diseases in a wide range of animals and humans, including measles and mumps in humans, Hendra virus, distemper and rinderpest. They are spherical, small and contain a single strand of RNA.

The genus Avulavirus contains nine types of paramyxoviruses that affect birds. Type 1 includes the avian paramyxovirus that has been infecting pigeons in Victoria (and globally), and also Newcastle disease. Even within Newcastle disease virus, there are strains with varying pathogenicity, so there is considerable variability within the type 1 avian paramyxoviruses.

Avian paramyxovirus strains are generally capable of affecting other avian species. This strain appears to be highly pigeon-specific. Experimental inoculation of poultry has demonstrated infection and spread of infection to in-contact poultry, but no apparent disease in infected poultry. Poultry in contact with infected pigeons have not shown signs of disease either. Single cases of disease have been identified in a collared sparrow hawk (native) and spotted turtle dove (introduced species).

Human infection with this virus is rare and usually occurs only in people who have close, direct contact with infected birds. The virus causes only mild flu-like symptoms. There is a negligible threat to dogs and other non-avian species.

Avian paramyxovirus type 1 in pigeons is endemic in most countries. Genetic analysis of this avian paramyxovirus, which is new to Australia, suggests it arrived from the Middle East.

The disease

Signs of pigeon paramyxovirus include:

- high morbidity and mortality (up to 100% in some flocks)
- loss of appetite, lethargy
- gastrointestinal signs including regurgitation and diarrhoea
- neurological signs such as head shaking, torticollis
- respiratory signs.

There is no specific treatment for this disease. Infected birds often die within 72 hours but may survive with supportive therapies.

Gross lesions may be completely absent. If present, they are not pathognomic, generally being haemorrhagic and affecting one or several of four different systems: central nervous system, respiratory system, alimentary tract, and kidney.

Histopathological lesions are non-suppurative inflammation, hyperaemia, oedema and haemorrhage. They may also be associated with necrosis in the upper respiratory tract and gastrointestinal tract.

Investigation

Veterinarians should consider biosecurity risks for their practice when investigating such cases. This is a very virulent virus and will easily infect other birds within the clinic environment.

As with any close examination of animals that may be infected with a zoonosis, Biosecurity Queensland recommends the use of gloves, eye protection and P2 respiratory protection.

Laboratory investigation requires submission of:

- whole birds (preferably), dead or euthanased
 - sealed in a bag
 - chilled, not frozen
- cloacal swab
 - may be in sterile saline, chilled, but only if delivered to the lab on the same day
 - otherwise, in a virus transport medium.

Spread

The infection spreads readily between birds. Infected birds may shed the virus in their faeces and other discharges, contaminating the environment (including feed, water, equipment and human clothing) and allowing transmission to other birds. Environmental survival of avian paramyxovirus can be several weeks.

The spread of avian paramyxovirus is typically due to the movement of birds, but it can be carried in eggs or on equipment used with pigeons, as well as on people and their clothing.

Biosecurity

The introduction of pigeons, pigeon eggs and pigeon fittings from Victoria is banned. These restrictions may be varied in response to disease spread.

Owners can minimise the disease risk by implementing good biosecurity measures, generally by preventing direct and indirect contact with other racing, fancy and wild pigeons and especially by ensuring the health status of any contacts, introductions, shows, races, etc.

Other simple biosecurity measures that will help prevent disease outbreaks include personal, equipment and property hygiene, limiting visitation, preventing contact with wild birds and other pest animals, and quarantining new birds.

The virus is susceptible to disinfection with common detergent (allowing contact time of at least 15 minutes before washing off).

Further advice on preventative biosecurity is available at www.biosecurity.qld.gov.au

Vaccination

There is no vaccine in Australia registered for use against avian paramyxovirus in pigeons. There are pigeon vaccines available overseas, but it is unlikely that importation to Australia will be approved in the near future. Registered Newcastle disease poultry vaccines are available in Australia and could offer some cross-protection.

Newcastle disease vaccines that are registered for use in fowl in Australia can be either live or killed (inactivated). They are presented for vaccination of large numbers of fowl in commercial flocks.

Safety and efficacy

There is little safety and efficacy data on the use of Newcastle disease vaccine in pigeons in Australia. There is a single, unpublished trial of vaccinating 15 pigeons with live Newcastle disease vaccine and 15 pigeons with killed Newcastle disease vaccine, with no adverse reactions but only one weak positive sero-conversion. Sero-conversion may not be a good measure of the efficacy of vaccination.

Overseas experience has demonstrated good protection against clinical signs of paramyxovirus in pigeons by some poultry vaccines. However, there are differences in the virus strains between the vaccine and the pigeon-specific avian paramyxovirus. These differences may result in a failure to protect pigeons, partial protection or a much shorter duration of protection than expected, especially with the live vaccine.

Vaccination entails some risks to the health of pigeons, especially with the killed vaccine, due to overdosing, injecting into the muscle or bacterial infection at the injection site. Accidental self-inoculation by a vaccinating person can cause a severe local reaction.

Veterinarians may be asked by pigeon owners to advise on the potential risks and benefits of vaccination.

Live vaccines

The live vaccines for Newcastle disease in Australia contain a mild strain known as V4. In fowl, this strain causes little or no disease but still generates immunity, although usually of short duration.

Live vaccines are easy to administer to large numbers of birds, either by eye drop or by mouth. If given in drinking water, it must be consumed within 2-3 hours of being mixed. The smallest presentation of live V4 vaccines is 1000 doses.

Killed vaccines

A killed or inactivated vaccine contains a strain of virus known as La Sota that has been killed.

The vaccine also contains adjuvants to stimulate stronger and longer lasting immunity than is achieved by live vaccines. These adjuvants can also cause adverse reactions.

This vaccine has to be injected into the bird. For fowl it is injected into the breast or thigh muscle or under the skin at the lower part of the neck. Intramuscular injections may not be suitable for pigeons. Preferred injection sites for pigeons may be subcutaneous at the base of the neck or between the leg and the body.

The killed vaccine must not be frozen. It should be kept at the manufacturer's recommended temperature (usually between 4-8 degrees Celsius).

Inactivated vaccines are usually presented as a 1000-dose bottle, and may be available as a 250-dose bottle.

Summary data on vaccines available in Australia

Bioproperties	Vaxsafe ND vaccine (living)	Live
MSD Australia (Intervet)	Intervet Nobilis live Newcastle vaccine V4	
Pfizer Animal Health	Poulvac Newcastle v4	
MSD Australia (Intervet)	Nobilis Newcavac vaccine against Newcastle disease in poultry	Killed
Pfizer Animal Health	Poulvac Newcastle IK vaccine (inactivated)	

Administration

The recommended vaccination course for poultry is to administer live vaccine, followed by administration of killed vaccine at least four weeks later. However, either of the vaccines may be used on its own.

The suggested vaccination course for pigeons is two doses of killed vaccine by subcutaneous injection a few weeks apart. Only healthy birds in healthy flocks should be vaccinated. It is not known whether or for how long vaccinated pigeons will be protected. An annual booster is likely to provide greater assurance of ongoing protection.

As vaccines work by stimulating immune protection, they can take some weeks to take effect. Newcastle disease vaccine cannot treat pigeons already exposed or infected, nor provide maximum protection until at least a few weeks after the vaccination procedure has been completed.

The Victorian government recommends the consideration of vaccination as part of a pigeon flock biosecurity plan, in consultation with a veterinarian. Biosecurity Queensland acknowledges the Victorian recommendation in the context of spreading disease, but in the absence of safety and efficacy data, does not endorse the use of Newcastle disease to prevent or control avian paramyxovirus type 1 in pigeons.

Biosecurity Queensland also emphasises that preventative biosecurity should be the primary tool for protection, with vaccination being used only as an adjunct.

Veterinary instructions

Administration of Newcastle disease vaccine to pigeons is an off-label use of a product registered for use in fowl. Off-label use is permitted only under written instructions provided by a veterinary surgeon and where the pigeons to be vaccinated are under the care of the veterinary surgeon.

The veterinary instructions must be given to the end user and must include specific information on vaccine dose, how many doses and how far apart, route of administration and details of birds to be vaccinated. Additional restrictions may apply if pigeons are used for food production.

A permit from Biosecurity Queensland is required for use of Newcastle disease vaccine in fowl but not in pigeons.

Notification

Avian paramyxovirus 1 is a notifiable disease in Queensland. The signs of avian influenza type 1 are similar to those of Newcastle disease, and respiratory signs may be difficult to distinguish from avian influenza.

If you notice clinical signs or high death rates in pigeons, poultry or other birds, call Biosecurity Queensland on 13 25 23 or the Emergency Animal Diseases hotline on 1800 675 888.

Information on deaths in feral pigeons should also be provided to Biosecurity Queensland. This reporting is essential for Biosecurity Queensland to actively monitor the introduction of the disease and to respond by providing advice to pigeon owners.