VICTORIAN PIGEON VIRUS: A NEW THREAT FOR RACING PIGEON LOFTS

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Pathogen:
- Family Reoviridae
  - Genus Rotavirus
    - Avian Rotavirus A subtype G18P[17]
      - (Preliminary name: Victorian Pigeon Virus (VPV))
  - Similarities to rotaviruses isolated from a red fox (Vulpes vulpes) in Italy and a spotted dove in China (Streptopelia chinensis)

Normally rotaviruses cause inflammation of the gut predominantly of juvenile individuals and the mortality rates are usually low. However, this new rotavirus does not lead predominantly to enteritis but to a massive inflammation of the liver which is responsible for high mortality rates observed in pigeons of all ages.

In general, rotaviruses have a high tenacity which means that the virus can stay infectious in the environment of the loft for months.

Disease description based on field observations:
- Time from suspected infection to clinical symptoms: < 10 days
- Greenish diarrhea
- Vomiting
- Crop stasis
- Death usually 12-24 hours after onset of disease
- Mortality: 15-40%
- Duration of clinical symptoms observed in a loft: 5-7 days
- More severe clinical signs in adult pigeons
- Pigeons that are severely ill will die

Epidemiology and spread of the virus:
The epidemic began at the 20th of May 2016 in pigeon lofts in West-Australia. Pigeons with symptoms such as vomitus, diarrhea and apathy quickly died. It was excluded that these losses were due to paramyxovirus (PMV) or avian influenza virus. Finally an adenovirus was assumed as the cause of the disease, but was never actually confirmed. As there are no special treatments or regulations for adenovirus infections in pigeons, no restrictions were made concerning shows, races or trade of pigeons in Australia. Therefore the virus could spread easily over long distances and in December it reached the East coast of Australia

leading to more losses in racing pigeons.
By the time it became evident that this new disease was caused by a virus, false information
was distributed in the social media. So-called experts recommended to deliberately introduce the virus into unaffected lofts in order to achieve a “natural immunization” of the surviving birds. Some breeders followed this advice, accepting that many of their pigeons severely suffered or even died. This strategy was not only lacking real evidence and contradicted animal welfare, it also led to a further distribution of the virus into other states of Australia.

In March 2017 the virus left already mainland Australia and infected pigeons in Tasmania leading to an international alert by the World Organisation of Animal Health (OIE) (reference 1).

Consequences for pigeons in Australia:
The Australian National Pigeon Association (ANPA) cancelled all pigeon exhibitions for 2017 to protect the pigeons from the disease until a special treatment or prevention is available. Contrary to that, the Australian National Racing Pigeon Board (ANRPB) only made recommendations but left the final decision of whether or not to race in 2017 to the regional clubs. This is highly risky as it is not known yet, how long surviving pigeons of previously infected lofts can be carriers of the virus and potentially infect other pigeons. The data collected so far indicate that pigeons can be carriers for at least 4 months. Therefore a new wave of outbreaks is to be expected during the current racing season.

Threat for racing pigeons worldwide:
The Australian government did not declare a ban to export pigeons to other countries. Therefore Australian pigeons can be traded across borders and imported into other countries unless an import ban for Australian pigeons is in place in the respective countries. Taking into account the long carrier status and infectivity of pigeons from lofts previously infected, this poses a high risk to distribute the disease worldwide.

A particular threat to the world-wide pigeon populations is the participation of Australian pigeons in international One-loft-races. As a consequence of a lack of export and import regulations, Australian pigeons may have been delivered already to these races.

An introduction into Europe could have a fatal outcome depending on the immune status of the pigeon population. Unfortunately no information is available whether the population may possess a pre-existing protective immunity against this rotavirus or not. In the worst case scenario, the disease would hit an immunologically naive European racing pigeon population, leading to the death of thousands of pigeons.

Furthermore, it can be expected that the virus will spread much more rapidly across Europe as compared to Australia. European pigeon sport is well connected and racing flights can span several countries. In contrast to Australia, Europe is densely populated, resulting not only in a relative close proximity of lofts but also millions of susceptible feral pigeons may contribute to the distribution. The presumably naive immune status combined with the absence of geographical and political borders are important risk factors facilitating a rapid spread of the Australian rotavirus across other continents and particularly Europe.

Diagnosis:
As a result of the combined efforts of the state Victoria, Dr Colin Walker, the laboratory AgriBio, Australian Animal Health Laboratory (AAHL) and researchers of the University of Melbourne, finally a rotavirus was identified as the cause of the disease, which is tentatively called “Victorian pigeon virus” (reference 2). Sequencing of the complete genome of the
virus allowed the development of a PCR (polymerase chain reaction) assay for a rapid detection. Unfortunately, at present this method is not available for other laboratories outside Australia, yet, so that in case of an entry of the virus in other countries diagnosis may be severely hampered by the lack of suitable detection assays. As long as no tools are available, it is important to exclude paramyxoviriosis as the main differential diagnosis. Furthermore because of the novelty of the disease the cause of the losses may be misdiagnosed and blamed on other pathogens. As described above, this happened during the first series of outbreaks in Western Australia before the discovery of the causative rotavirus and lead to a further spread of the virus due to lack of biosecurity measurements. The same may happen again when the virus reaches other continents in the absence of efficient diagnostic measures.

**Future perspective:**
Currently different vaccine candidates are tested in Australia and hopefully in March 2018 a vaccine will be available.

**Recommendations to the FCI:**

1) **Containment of further distribution of the VPV (from Australia)**
   - It is essential to inform all members of the FCI that they are aware of the existence of the Victorian pigeon virus and its threat to the pigeon sport worldwide.
   - Ban of Australian pigeons to participate in shows or races in other countries, particularly in One-loft-races (OLRs).
   - Recommendation by the FCI send out to all known organizers of OLRs not to accept Australian pigeons in 2017 (or until the virus is eradicated in Australia or/ and an effective vaccine is available)

2) **Establishment of an information system**
   - Cooperation with vets and universities regarding the distribution of the new rotavirus
   - Bundling of information concerning this new rotavirus outside Australia to create a reliable website for information of breeders, vets and officials and to counterbalance false information in the internet.

3) **Measures after a rotavirus introduction into a country**
   - Immediate cancelling of shows, racing flights and OLRs.
   - Export of pigeons from an affected country should be prohibited.
   - Recommendation to OLRs not to accept pigeon from affected countries.

4) **Biosecurity measures in infected lofts**
   As there is no effective treatment against rotavirus infection, the major aim of all countermeasures should be the prevention of further spread via strict biosecurity.
   - **Prevention of spread within an infected loft**
   - If separated lofts/groups of pigeons exist on one premise, take care of the healthy groups before going to the affected groups.
- When entering an infected loft/group, use shoes and clothes specifically assigned only in this particular loft. Always wash and disinfect hands before and afterwards.
- Tools and material should be separated between affected and healthy groups or thoroughly disinfected after usage in an affected group before the introduction to the other group.

**Prevention of spread between lofts**
- Restriction of visits of other breeders
- Do not visit other lofts with the same clothes you used in the infected loft
- No participation in exhibitions or races or selling pigeons from an infected loft for several months

5) Special support of clinically ill pigeons
An effective treatment of rotavirus-infected pigeons is not available. However, several measures may be implemented which may help diseased pigeons to recover and at least reduce mortality in the flock.

The main aim at flock level is to prevent dehydration due to vomitus and diarrhea by adding electrolytes into the drinking water. Furthermore, hygiene is very important as repeated cleaning and disinfection can reduce the infection pressure.

Clinically ill pigeons should be supported by the following recommendations which are based on experiences made in Australia and which were summarized by Dr Colin Walker (reference 2):

- **Feed**
  - Crop feeding: hand rearing formulas made for seed eating birds such as parrots; depending on level of crop stasis 2-20ml per meal several times daily; (skip additional vitamins or minerals, everything needed is in the formula)

- **Treatment of trichomonads with tablets**
  - Especially if the crop empties slowly during rotavirus infection, the milieu may support the replication of trichomonads and the pigeons may additionally suffer from wet canker.

- **(Antibiotics)**
  - The use of antibiotics is discussed controversially as no reduction of mortality could be observed due to antibiotic treatment.

References:

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