RESPONSE TO THERAPY WITH POTASSIUM ARSENITE IN FALCONS INFECTED WITH AVIPOXVIRUS

Walter Tarello* (DVM, MA Cardiology, MRCVS)
*Pet Connection Veterinary Clinic, Al Barsha 1, Summer Land Building, P.O. Box 450288, Dubai, UAE
Tel: +971 4 447 53 07
Email: wtarello@yahoo.it

BACKGROUND

Avian pox is a viral disease characterized by nodular lesions on the featherless parts of a bird: eyelids, nostrils and feet. Falcons in the Middle East are naturally exposed to Avipoxvirus through insect bite, direct contact or by aerosol. The aim of this study is to provide a safe and effective therapy for falconpox, based on the use of potassium arsenite, which proved recently successful in inhibiting naturally acquired Capripoxvirus infection in sheep (Tarello & Kinne 2007).

Figure 1. Eyelid pox lesion in a falcon.
METHODS

Forty-six (46) non vaccinated, naturally *Avipoxvirus*-infected falcons from Kuwait were treated intramuscularly with *potassium arsenite* 0.5% at doses of 0.37 mg of As/Kg/day, for 8 consecutive days.

Forty-six (46) non vaccinated, naturally *Avipoxvirus*-infected falcons from Dubai were not treated, and kept as control group, based on the assumption that there is no cure for pox. Diagnosis was based on skin lesions (figs. 1-2), microscopic finding of Bollinger bodies in the epithelial cells (fig. 3) and isolation of *Avipoxvirus* in one representative case.

RESULTS

*Potassium arsenite* treated falcons from Kuwait obtained disappearance of collateral signs (weight loss, anorexia, lethargy) in 24 (52.2%) birds within 2 to 4 days (Table 1), with an average recovery time of 2.6 days. Complete healing of skin poxes was recorded within 20 days (Table 2), with an average recovery time of 9.3 days.

In the control group of untreated falcons from Dubai three falcons died and collateral signs, recorded in 19 (41.1%) of birds disappeared in 5 to 15 days (Table 1), showing an average recovery time of 8.3 days. Complete healing of skin poxes was obtained in 10 to 39 days (Table 2) with an average remission time of 25 days. *Avipoxvirus* was isolated in scab material from 1 falcon using routine methods (Wernery and others 1998).

<table>
<thead>
<tr>
<th>TABLE 1 - COMPARISON OF RECOVERY TIME FROM COLLATERAL SIGNS OF AVIPOXVIRUS INFECTION IN FALCONS TREATED (KUWAIT) AND NON TREATED (DUBAI) WITH POTASSIUM ARSENITE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recovery time in days</strong></td>
</tr>
<tr>
<td>(2)</td>
</tr>
<tr>
<td>N=24 treated falcons from Kuwait</td>
</tr>
<tr>
<td>N=19 non treated falcons in Dubai</td>
</tr>
</tbody>
</table>
Figure 2. Pox lesion on the nostril.

<table>
<thead>
<tr>
<th>Recovery time in days</th>
<th>0-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21-25</th>
<th>26-30</th>
<th>31-35</th>
<th>36-40</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=46 treated falcons from Kuwait</td>
<td>2</td>
<td>32</td>
<td>10</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>n=43 non treated falcons in Dubai</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>7</td>
<td>16</td>
<td>10</td>
<td>7</td>
<td>2</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Avipoxvirus-infected falcons treated with potassium arsenite experienced a significantly 3-fold shorter recovery time compared with controls. This study indicates that potassium arsenite can sharply decrease the severity and duration of cutaneous and collateral signs of Avipoxvirus infection in falcons and prevent the associated mortality. In this trial, the rapid elimination of cutaneous and collateral signs of pox was strictly associated to the administration of potassium arsenite (Tables 1 and 2).
Supportive medication is suggested for exposed birds, but there is no prove that such treatments influence the duration and severity of clinical signs and the mortality rate (Pages-Mante et al., 2004). To date there is no cure for avian poxvirus.

The efficacy of potassium arsenite was recently noticed in sheep from UAE naturally infected with Capripoxvirus (Tarello and Kinne, 2007). The active molecule of potassium arsenite, arsenic trioxide, has recently shown in vivo inhibitory effects against viruses HTLV-1 and HTLV-2 in humans (Mahieux and Hermine, 2005). Therefore, it should not be controversial to observe similar outcomes in falcons infected with avian pox virus. Additionally, arsenic trioxide is today successfully used for treating a variety of blood tumors, such as leukemia in falcons (Tarello, 2006) and human beings and solid cancers (Waxman and Anderson, 2001) in men, thus excluding a potential carcinogenetic risk.

**CONCLUSIONS**

In short, potassium arsenite should be regarded as a promising medication against avian pox in falcons.
REFERENCES


-Tarello, W., 2006. Lymphoid leukaemia in a saker falcon. Veterinary Record 158, 212.

-Tarello W., Kinne J., 2007. Complete remission after treatment of Capripoxvirus infection in sheep using potassium arsenite 0.5% (Fowler’s solution). Revue de Medecine Veterinaire 158, 489-492
