Common zoonosis in exotic birds

M. Krautwald-Junghanns
Common zoonosis in exotic birds?

none!
Diseases and death in humans due to infectious zoonotic agents in Germany

<table>
<thead>
<tr>
<th>Disease</th>
<th>n</th>
<th>/10^6 i.</th>
<th>Death</th>
<th>n</th>
<th>/10^6 i.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salmonellosis</td>
<td>196.392</td>
<td>2.395</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virushepatitis</td>
<td>13.711</td>
<td>167</td>
<td></td>
<td>1.217</td>
<td>14.8</td>
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<tr>
<td>Virus-Meningo-Enc.</td>
<td>2.584</td>
<td>32</td>
<td></td>
<td>245</td>
<td>3.0</td>
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<tr>
<td>Bact. meningitis</td>
<td>1.785</td>
<td>22</td>
<td></td>
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<tr>
<td>Tuberculosis</td>
<td></td>
<td></td>
<td>558</td>
<td>6.8</td>
<td></td>
</tr>
<tr>
<td>Shigella</td>
<td>1.610</td>
<td>20</td>
<td></td>
<td></td>
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<tr>
<td>Q-Fever</td>
<td>273</td>
<td>3.3</td>
<td></td>
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<tr>
<td>Chlamydirosis</td>
<td>107</td>
<td>1.3</td>
<td></td>
<td>5</td>
<td>0.06</td>
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<tr>
<td>Gastroedema</td>
<td>98</td>
<td>1.2</td>
<td></td>
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<tr>
<td>Leptospirosis</td>
<td>47</td>
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<td>Listeriosis</td>
<td>33</td>
<td>0.4</td>
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<tr>
<td>Toxoplasma</td>
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<td>0.4</td>
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<tr>
<td>Brucellosis</td>
<td>21</td>
<td>0.3</td>
<td></td>
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<tr>
<td>Trichinosis</td>
<td>21</td>
<td>0.3</td>
<td></td>
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<tr>
<td>Botulism</td>
<td>19</td>
<td>0.2</td>
<td></td>
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<tr>
<td>Tetanus</td>
<td>8</td>
<td>0.1</td>
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<tr>
<td>Rabies</td>
<td>0</td>
<td>0.0</td>
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</tr>
</tbody>
</table>
## Source of chlamydia psittaci infection in humans

<table>
<thead>
<tr>
<th>Infection from</th>
<th>No./ infected humans</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psittaciformes and canaries</td>
<td>21</td>
<td>26,2</td>
</tr>
<tr>
<td>Pigeons</td>
<td>11</td>
<td>13,8</td>
</tr>
<tr>
<td>Chicken and ducks</td>
<td>10</td>
<td>12,5</td>
</tr>
<tr>
<td>Birds of unknown species</td>
<td>16</td>
<td>20,0</td>
</tr>
<tr>
<td>Source unknown</td>
<td>16</td>
<td>20,0</td>
</tr>
<tr>
<td>professional exposition :</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poultry slaughteries</td>
<td>4</td>
<td>5,0</td>
</tr>
<tr>
<td>Zoo shops etc.</td>
<td>2</td>
<td>2,5</td>
</tr>
<tr>
<td>Sum</td>
<td>80</td>
<td>100,0</td>
</tr>
</tbody>
</table>

Statens Serum Institut, Copenhagen, 2000

Contact frequency:
- 540 healthy people, 12.7 % positive, majority having daily or weekly contact to birds
- Harkinezhad et al., 2009
Chlamydiosis-Cases in Germany

<table>
<thead>
<tr>
<th>Year</th>
<th>Psittacines</th>
<th>Humans</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>155</td>
<td>72</td>
</tr>
<tr>
<td>2008</td>
<td>137</td>
<td>86</td>
</tr>
<tr>
<td>2009</td>
<td>157</td>
<td>26</td>
</tr>
<tr>
<td>2010</td>
<td>76</td>
<td>25</td>
</tr>
<tr>
<td>2011</td>
<td>48</td>
<td>?</td>
</tr>
</tbody>
</table>

Underestimated?
Vanrompay et al., 2010: 39 psittacine flocks – 30% positive, 13% of breeders positive (all having positive parrots)
Psittacosis-VO

• Anzeigepflicht → Amtstierarzt entscheidet über Vorgehen

• Maßnahmen:
  Bestandssperre
  Kennzeichnung
  Schutzkleidung
  Personenrestriktion
  amtliche Kulturproben 
  Verbringungsverbot

• Behandlung oder Tötung (wenn Behandlung nicht erfolgsversprechend)
Epidemiology and pathogenesis

- Transmission via secretion/aerogen: feather dust, faeces...
- Latent infected carriers play an important role!
- Often after predisposing stress factors
Therapy

Tetracyclines, Quinolones - i.m., oral

*Vanrompay et al., 2010:*
46.2% of breeders used antibiotics as „prophylaxis“

44% of these flocks were *Chl. psittaci* positive

effective in diseased birds (reticulary bodies)
elementary bodies remain infective in feather dust for months
Tuberculosis (human)

Obligatory pathogenic mycobacteria in humans:

Mycobacterium leprae

Mycobacterium tuberculosis complex (MTC)

M. tuberculosis
M. bovis*

M. africanum
M. microti
M. canettii
M. pinnipedii


Avian Tuberculosis

Non tuberculous mycobacteria (NTM):

- *M. genavense*
- *M. gordonae*
- *M. nonchromogenicum*

*Mycobacterium avium complex (MAC)/Mycobacterium fortuitum complex (MFC)*

- *M. a. subsp. avium*
- *M. fortuitum*
- *M. intracellulare*

- *M. a. subsp. paratuberculosis*
- *M. a. subsp. hominissuis*
- *M. a. subsp. silvaticum*
- *M. chelonae*

Avian Tuberculosis

- No scientific prove of a transmission pet bird - humans
- *M. tuberculosis*: transmission humans - parrot
- Zoonotic potential: *M. avium-complex, M. genavense*..., oral infection

- diagnosis and treatment difficult
- *M. avium* resistant against mostly all drugs in human medicine (pr: acithromycin, th:isoniazid, cefpodoxin)
Other bacteria

- *Salmonella typh. /ent.* poultry, (ducks)
- *Campylobacter jejuni* wild birds, poultry
- *Erysipelotrix rhusiopathiae* wild birds, poultry
- *Pasteurella multocida*
- *E.coli*
- *Pseudomonas aeruginosa*
- *Yersinia pseudotuberculosis*
Avian viruses

DNA-Viruses
- non-env.
- envel.
  - Circovirus
  - Parvovirus
  - Hepadnavirus
  - Papillomavirus
  - Polyomavirus
  - Adenovirus
  - Herpesvirus
  - Poxvirus

RNA-Viruses
- non-env.
- envel.
  - Picornavirus
  - Astroviren
  - Birnavirus
  - Reovirus
  - Togavirus
  - Flavivirus
  - Paramyxovirus
  - Orthomyxovirus
  - Coronavirus
  - Rhabdovirus
  - Retrovirus
  - Bornavirus
Influenza A

• all birds susceptible, H5, H7
• horizontal transmission via secretion/excretion

• Avoid contact to waterfowl, poultry
• Cave: asian imports
H5N1 affected birds in 2006 in Germany:
344 wild birds (60,000 tested)

- No Columbiformes
- 1% Passeriformes
- < 10% Carnivorous species
- > 90% waterfowl

Swans!
Until now no known infection of men via mammals, pet birds and wild birds
PMV-1 (Newcastle Disease)

- all birds susceptible
  transmission through
  secretion, excretion,
  horizontal
West Nil

Diseases in humans often mild, undetected, flu-like
< 1% encephalitis, meningitis
West Nil

- transmission via insectes (culex)
- mainly corvidae and other wild passeriformes susceptible, (raptors) (men)
  some species (f.e.psittaciformes) are known to be incompetent hosts

- reduction of insectes
- birds in closed aviaries in endangered areas