Should dog breeders worry about The Canine herpes virus?

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Scientific Communication

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Introduction

• Specificities of the herpes virus family
  – Local (adult) or systemic (neonates) disease
  – Located in the nervous, respiratory or genital tract
  – Opportunistic, low immunogenicity
  – Latency

• Specificities of the CHV
  – Low resistance in the environment
  – Optimal replication temperature
    35°C < < 36°C
  – Stable below 4°C
GENOME ADN DS 125-235 kbp

> 30 protéines structurales

Nbreuses protéines régulatrices
SYMPTOMS & LESIONS

• **In adults**
  – Female: papules & vesicles on the vaginal mucosae during 15 to 30 days
  – Males: papules & lymphoid nodules during a few days
  – When facing a primary infection (Female)
    • *Early contamination*
    • *Late contamination*
  – Respiratory form
SYMPTOMS

• In Neonates
  – pelvic contamination during whelping
  – Neonatal viremy (poikilothermic)
  – Herpetic Meningoencephalitis
  – Less acute forms (Fading Puppy Syndrome)
  – Consequences in case of survival (ataxia, blindness)

• In young puppies < 3 w
  – rhino pharyngitis
  – keratitis, conjunctivitis,
  – Retina dysplasia
Finding at necropsy

• Acute forms

• Middle acute forms
  – Enlargement of the spleen
  – Petechia on multiple organs (mainly kidneys: nutmeg)
  – Intra nucleus inclusions (kidneys, liver, spleen, lungs)
  – meningo-encephalitis, even without nervous symptoms.

• Pro & cons / autopsy
EPIDEMIOLOGY

• **Viral sources**
  – Other Canids (rare)
  – Virulent stuff during symptomatic time (all secretions, semen, saliva, tears, coughing aerosol, urine, stools)
  – Genital & respiratory transmissions are prevalent

• **Contamination mode**
  – Mating or Artificial Insemination (from Male to Female)
  – During whelping
  – Synergy with Distemper, viral diarrhea, kennel cough
Transmission of CHV (except venereal transmission)

Through placenta
(all stages of gestation)

- Mummification
- Fetal resorption
- Abortion
- Stillbirth
- Neonatal mortality

Oro-nasal route
- Secretion from littermates
- Vaginal secretion
- expectorations

Healthy carrier
Non carrier

Puppy
> 2 w.
Respiratory form

Puppy
< 2 w.
Septicemia form

(From H.Poulet, Point Vétérinaire)
Prevalence in breeding kennels

- Survey LCRV/CNEVA = % SN+ (1)
- UMES: 30.6% of French kennels are positive
- Collectivities / private owner
- CHV is a concern mainly in collectivities

<table>
<thead>
<tr>
<th>Number</th>
<th>Seropositive</th>
<th>Isolated</th>
<th>Collectivities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private owners (5%)</td>
<td>185</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Kennels (28.5%)</td>
<td>433</td>
<td>123</td>
<td></td>
</tr>
<tr>
<td>Pays</td>
<td>Année</td>
<td>N° de chiens</td>
<td>Prevalence</td>
</tr>
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</tr>
<tr>
<td>USA</td>
<td>Fulton 1974</td>
<td>100 chiens</td>
<td>6.0%</td>
</tr>
<tr>
<td>Belgique</td>
<td>Schwers 1980</td>
<td>100 chiens</td>
<td>1.0%</td>
</tr>
<tr>
<td>Suisse</td>
<td>Engels 1980</td>
<td>632 chiens</td>
<td>6.3%</td>
</tr>
<tr>
<td>France</td>
<td>Delisle 1982</td>
<td>433 chiens d'élevage</td>
<td>28.4%</td>
</tr>
<tr>
<td>France</td>
<td>Poulet 1991</td>
<td>345 chiens d'élevage</td>
<td>15.9%</td>
</tr>
<tr>
<td>Pays -Bas</td>
<td>Rijsewijk 1997</td>
<td>135 chiens d'élevage</td>
<td>40.7 %</td>
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<tr>
<td>U.K.</td>
<td>Reading 1998</td>
<td>325 chiens</td>
<td>88% (IgG)/78% (IgM)</td>
</tr>
</tbody>
</table>

Increased prevalence in France between 1980 & 2000 (P.M. Guigal, 2000)

68% of seropositives facilities face reproduction disorders
Pathogeny

- Opportunistic virus (immature puppies, immunocompromised or sick dogs)
- Tropism for the nervous system (lymph nodes)
- Predisposition of neonates
Pathogeny

• Latency (trigeminal lymph node, lombosacral, kidney)
• Recurrences & viral reactivation (stress, cold, estrus, whelping, immunodeficiency [gestation or iatrogenic])
• Post-infectious Immunity
  – Low immunogenicity
  – Glycoproteins on the envelope targeted by antibodies
  – Maximum level of Ab 2 weeks after primo-infection
  – Maternal antibodies protect from the disease but not from infection: all life long infection
**Diagnosis**

- **Clinical suspicion**
  - age
  - Breed (in a multiple breed kennel)
  - Mortality rate
  - Differential diagnosis (mycoplasmosis, toxoplasmosis, Brucellosis, CPV₁)

Ab anti-CHV

Pro-estrus  Whelping  Anestrus
Diagnosis

• **Laboratory diagnosis**
  – virus isolation (difficult) : μe-
  – Witness of the viral footprint
    • **histology**
    • *Serology Kinetics (SN Maternal Ab > ¼)*
  – Isolation of viral DNA
    • **PCR +++**
Sampling for PCR
Treatments

• Impossible to eradicate (difficult testing)
• Decrease neonate mortality rate
• Identify bitches and neonates at risk
• Tube feeding only after warming up
• Beware of rehydration
Video surveillance of the nursery © Royal Canin

- *post partum* Isolation
- C-section may limit contamination at whelping
- Decreasing venereal transmission
- Decrease oronasal transmission (Kennel cough vaccination)
- Vaccine Eurican CHV F-205® (lab Merial)

C-section, © ENVA
Vaccination

• **Innocuity**
  – Inactivated Vaccine made of purified viral sub units

• **Objectives**
  – Vaccinate the mother to protect her puppies *via* the colostrum

• **Results (20 breeds, 180 bitches, 500 birth)**
  – Reduction of the neonatal mortality due to CHV by 62%
  – Improvement of the fecundity rate (82% vs 67.9%)

• **Vaccination Protocol**
  – Regardless of the serological status of the mother
  – Heat < Inj1 < Mating + 10, 45 d < 2d inj < 57d
• Q & A
  – What if a stud dog is positive?
  – Can CHV be transmitted by passive vectors?
  – Should I get rid of all my reproductive dogs?
  – Does a dog remain positive all his life?
  – Are the puppy born positive?
Herpes virose canine

Renal petechia due to CHV