Case Report —
An Infectious Bursal Disease Virus
Outbreak in 14- and 15-week-old Chickens
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SUMMARY
Infectious bursal disease virus (IBDV) observed in a flock of
14- and 15-week-old chickens was typical of the acute symptomatic
IBDV infections more common in younger birds. High flock mor-
bidity was indicated by a marked decrease in feed consumption,
although deaths were not excessive. At necropsy, affected birds had
small hemorrhages in thigh muscles, creamy-yellow-colored bursae
of Fabricius with prominent longitudinal striations, and swollen
mottled kidneys. Histopathologic examination revealed bursal
lesions typical of IBDV infection. One of six sera from necropsied
birds was positive for antibody to IBDV in the agar-gel precipitin
(AGP) test, and one week later all 35 samples tested were positive.
Bursae were homogenized and found to contain IBDV as evi-
denced by precipitation, with antibody to IBDV, in the AGP test.

INTRODUCTION
The acute symptomatic manifestations of infectious bursal
disease virus (IBDV) infection usually occur in chickens 2 to 6
weeks old (2,3,7). The narrow age range of susceptibility has not
yet been adequately explained. The upper age limit, however, may
be due to the cessation of growth and natural involution of the
bursa of Fabricius, the primary site of IBDV replication (1,5,6).
In White Leghorns, bursal growth slows at 6 weeks of age and
involution begins at 10 weeks of age (4). If suitable target cells
remain in the bursae for some time during its involution, occasion-
al "late" IBDV outbreaks may occur in susceptible birds. This
report described a "late" IBDV outbreak in 14- and 15-week-old
chickens.

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Fig. 1. Bursal fold illustrating interfollicular edema with atrophy and cystic necrotic centers in bursal follicles. H & E, ×25.

Fig. 2. Bursal follicles with nearly complete loss of cortical lymphocytes, hyperplasia of germinal reticular cells, and cystic necrotic centers. Also evident are interfollicular edema and heterophil infiltration. H & E, ×100.
Infectious bursal disease outbreak

MATERIALS AND METHODS

Flock history. Thirty thousand White Leghorns were brooded in 1978 on litter in two houses near each other. The birds in House 1 were hatched on 7 January and those in House 2 on 11 January. The outbreak was first noticed in House 2 on 20 April (14 weeks posthatch). The poultryman reported that many birds appeared unthrifty, and feed consumption declined to about half of normal. Although many birds appeared to be weak, mortality remained low, at about 6 birds per week (0.04%). In one week the disease spread to birds in House 1 and showed identical signs. Mortality remained low, and recovery was relatively rapid (7–10 days) and uneventful.

The flock was not vaccinated for IBDV but was vaccinated for infectious bronchitis at 13½ weeks of age. The only medication given was a continuous low-level feeding of coccidiostat.

Agar-gel precipitin test (AGP). AGP plates were made with 1.25% agarose (Sigma Chemical Co., St. Louis, Missouri) in barbital buffer (pH 8.2) with 8% NaCl and 0.01% sodium azide. The IBDV antigen (Ag) was a bursal homogenate (in nutrient broth

Fig. 3. Higher magnification of one of the cystic necrotic follicular lesions shown in Fig. 2. Proteinaceous debris and heterophils can be seen. H & E, ×250.
Table 1. IBDV outbreak in 14- and 15-week-old chickens in 1978.

<table>
<thead>
<tr>
<th></th>
<th>House 1</th>
<th>House 2</th>
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<tbody>
<tr>
<td>Hatch date</td>
<td>7 Jan.</td>
<td>11 Jan.</td>
</tr>
<tr>
<td>Onset of outbreak</td>
<td>25 Apr.</td>
<td>20 Apr.</td>
</tr>
<tr>
<td>Days posthatch</td>
<td>108</td>
<td>99</td>
</tr>
<tr>
<td>Presented for diagnosis</td>
<td></td>
<td>21 Apr.</td>
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<tr>
<td>First serologic tests (AGP)</td>
<td></td>
<td>21 Apr.</td>
</tr>
<tr>
<td>IBDV-Ab-positive rate</td>
<td>1/6</td>
<td>Positive</td>
</tr>
<tr>
<td>IBDV Ag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subsequent serologic tests (AGP)</td>
<td>28 Apr.</td>
<td>28 Apr.</td>
</tr>
<tr>
<td>IBDV-Ab-positive rate</td>
<td>16/16</td>
<td>19/19</td>
</tr>
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</table>

+ gentamicin) from specific-pathogen-free (SPF) chickens that had been infected with a field strain of IBDV passaged twice in chickens. Antibody (Ab) to IBDV was a convalescent serum pool from IBDV-infected SPF chickens. Normal chicken serum was a pool from SPF chickens. Normal bursal suspension was a homogenate of bursae from SPF chickens. Field bursal suspension was a bursal homogenate from the affected chickens submitted for diagnosis.

**RESULTS**

**Necropsy.** On 21 April, six birds from House 2 were submitted to the California Department of Food and Agriculture Veterinary Laboratory Services in Sacramento. All birds were alive when presented. They had ruffled feathers, dark shriveled combs, and soiled feathers around the cloaca. Five of the chickens had small hemorrhages in thigh muscles. The bursa of Fabricius exteriors were covered with a greenish-yellow gelatinous exudate. The bursae were creamy-yellow in color, with prominent longitudinal striations, and 2 to 2 1/2 cm in diameter. In one bird the bursa appeared normal. The kidneys appeared to be somewhat swollen and mottled. Small white foci were evenly distributed in the spleens.

**Histopathology.** Histopathologic examination of bursae of affected birds showed lesions typical of acute IBDV infection. Severe edema of interfollicular septa with infiltration of heterophils was evident (Figs. 1, 2). Lymphoid elements all but disappeared from medullary centers, leaving hyperplastic reticuloendothelial cells, cellular debris, and heterophils (Figs. 2, 3). A few cystic cavities filled with pyknotic nuclei and heterophils were apparent, and bursal epithelium appeared hyperplastic.
**Bacteriology.** Routine bacterial cultures were nonproductive.

**Serology.** One of six serum samples from the necropsied birds was AGP-test-positive for antibody to IBDV. All of 35 serum samples collected one week later from the two houses were AGP-test-positive for antibody to IBDV (Table 1).

**Virus isolation.** Bursae from the necropsied birds were homogenized, and the resulting field bursal suspension was AGP-test-positive for IBDV antigen (Fig. 4).

**DISCUSSION**

The data indicate that a naturally occurring “late” IBDV outbreak in susceptible chickens results in typical manifestations of the disease as seen more commonly in younger birds. Characteristics of this outbreak included: 1) high morbidity with low mor-

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Fig. 4. AGP test demonstrating the presence of IBDV in bursae from affected chickens. (Ag) Bursal homogenate from IBDV-infected SPF chickens, (Ab) antibody to IBDV, (NCS) normal chicken serum, (NBS) normal bursal suspension, (FBS) field bursal suspension from affected chickens.
tality; 2) rapid spread to a neighboring chicken house; 3) a rapid and high rate of sero-conversion to IBDV Ab positive by the AGP test; and 4) the ability to demonstrate IBDV Ag early in the outbreak by using the AGP test with antibody specific to IBDV.

REFERENCES


ACKNOWLEDGMENT

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