Serological evidence of Avian Pneumovirus infection in broiler and layer chickens in Grenada, West Indies

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ABSTRACT

A serological survey was conducted to detect avian pneumovirus (APV) antibodies in commercial poultry birds in Grenada using a commercially available enzyme-linked immunosorbent assay (ELISA) kit. Sera were collected from 226 layers and 233 broilers. Age of the layers ranged from 12 to 18 months while that of the broilers ranged from 6 to 7 weeks. One hundred forty of the layers (61.9%) and 74 of the broilers (31.8%) were positive for APV antibodies. Chickens are not vaccinated for APV in Grenada and these results indicate that commercial poultry birds are exposed to this important poultry pathogen. This is the first report of serologic evidence of APV in Grenada and the Eastern Caribbean region.

Keywords: avian pneumovirus, chicken, Grenada, serology

Avian pneumovirus (APV), a metapneumovirus of the family paramyxoviridae, causes turkey rhinotracheitis (TRT), swollen head syndrome (SHS) and avian rhinotracheitis (ART). APV was first detected in turkeys in South Africa in the late 1970s (Buys and du Preez 1980). Later it was reported in chickens in South Africa (Morley and Thomson, 1984). By 1993, Alexander described TRT in Israel, France and Great Britain. Serological evidence of APV is now available from many countries of the world (Cook 1997). There is no published information on APV in Grenada and other countries of the East Caribbean region. The present study was conducted to find out the status of APV infection in commercial chickens in Grenada.

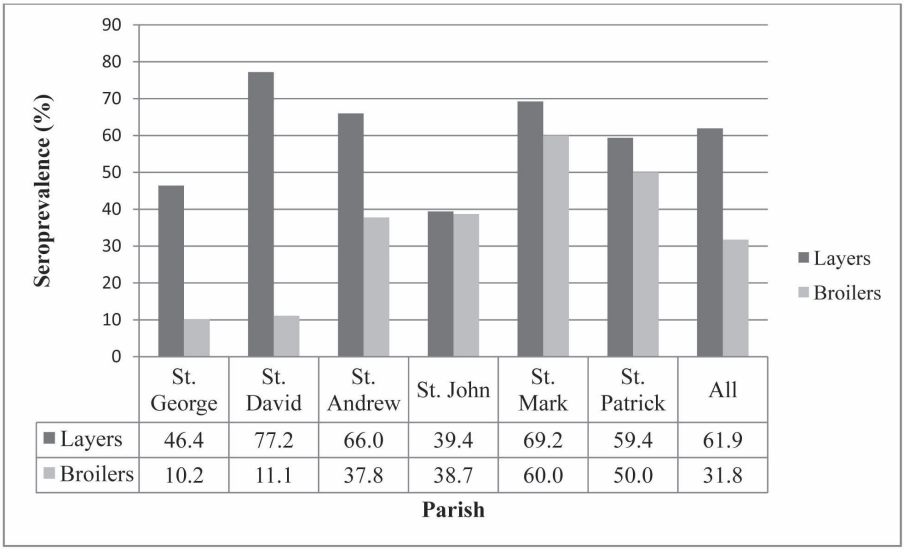
MATERIALS AND METHODS

A total of 459 blood samples were collected from commercial poultry flocks in various Parishes of mainland Grenada. Birds from layer flocks (n=226 birds) and broiler flocks (n=233 birds) were analyzed. The age of the layers varied between 12 and 18 months and the broilers were between 6 and 7 weeks of age. Blood samples from layers were obtained by brachial venipuncture. Blood from broilers

was collected during slaughter. A minimum of 25 blood samples were taken separately from layer and broiler flocks in each Parish. Sera were stored at -20^{0}C until tested for APV antibodies using a commercial ELISA (IDEXX APV) kit following the instructions of the manufacturers.

RESULTS

The survey revealed that 61.9% layers and 31.8% broilers in Grenada were serologically positive for APV (Figure 1). In the Parish of St John the seroprevalence was almost equal in layers and broilers, where as a higher rate of seropositivity was observed in layers in the other five Parishes (St. Mark, St. Patrick, St David and St. Andrew) as depicted in Figure 1.



	St. George	St. David	St. Andrew	St. John	St. Mark	St. Patrick	All
Layers	46.4	77.2	66.0	39.4	69.2	59.4	61.9
Broilers	10.2	11.1	37.8	38.7	60.0	50.0	31.8

DISCUSSION

A higher rate of seropositivity for APV in layer chickens observed in Grenada is in agreement with previous reports from other part of the world (Gough 2003; Owoade *et al.* 2006), suggesting that the virus in layer flocks is being transmitted between age group of flocks either by contact between flocks or by contamination of infrastructure. In Grenada, layers are usually maintained as multi age flocks. Transmission between flocks could be avoided by adopting an "all-in, all-out" replacement system of management and regular periodic decontamination. A lower rate of seropositivity for APV in broilers is expected since most broiler flocks in Grenada are managed as an "all-in, all-out" system.

In broilers, APV has been associated with clinical signs of swollen head syndrome (SHS). Layers infected with APV in the early phase of lay do not reach peak production, where as layers in their late phase of lay suffer a drop in egg production

(Paul McMullin 1998, Cook 2000). No clinical signs were reported in the broiler and layer flocks at the time of blood sample collection in this investigation. This is in agreement with previous reports from other parts of the world. APV has been isolated from chicken flocks without clinical signs (Johns *et al*., 1991) and chicken flocks free of clinical signs may have antibodies for APV (Cook *et al*., 1988; Pattison *et al*., 1989; Hafez and Lohren 1990).

Various strains of APV have been identified. Using serological and molecular techniques, APV has been grouped into three serotypes; A, B and C. The APV isolates from the United States has been grouped under serotype C (Cook *et al*., 1999; Seal 2000). Vaccines prepared from serotype A may confer immunity against serotype B (Cook *et al.,* 1995). Chickens are not vaccinated for APV in Grenada and the seropositivity for APV indicates that commercial chickens in Grenada are exposed to this important poultry pathogen. APV may cause serious economic losses in turkeys and chickens especially in the presence of concurrent bacterial and viral infections. Therefore, further studies to isolate and identify the strain of APV are warranted. Results of such a study would be strategic for institution of preventive measures against APV infection.

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