Detection of Avian Encephalomyelitis Virus antibodies in Commercial Layer Belt of Tamil Nadu

K.Sukumar1 and P.Sumitha
Department of Veterinary Microbiology, Veterinary College and Research Institute, Namakkal-637002, Tamil Nadu.

(Received : 26-05-2015; Accepted : 16-07-2015)

Abstract
In this study antibodies against avian encephalomyelitis virus was detected by indirect ELISA to test for prevalence of avian encephalomyelitis infection in commercial layer belt of Tamil Nadu. A total of 920 sera samples were collected from different age groups of commercial layers. A total seropositivity of avian encephalomyelitis virus was 79.35% and seropositivity of chicks, growers and layers were 28.13, 40.67 and 89.43 respectively. The seroprevalence was found to be higher among layers followed by growers and chicks. The examined layer flocks had no clinical signs, or noticeable drop in egg production. The detection of avian encephalomyelitis antibodies indicates that these flocks were exposed to a field strain of avian encephalomyelitis virus.

Key words: Avian encephalomyelitis, antibodies, layers

Avian encephalomyelitis (AE) is an infectious viral disease of poultry, which occurs in young chickens, turkeys, pheasants, Japanese quails, pigeons, ducklings and partridges. It is characterized by clinical signs of central nervous system disorder, particularly ataxia and tremors of the head, neck and limbs from where the name epidemic tremor was derived. The clinical signs are usually accompanied by high morbidity and variable mortality. Older poultry can become infected but rarely develop clinical signs, except a drop in egg production in layers (Calnek, 2008). Avian encephalomyelitis is a disease of economic concern to poultry farmers as it causes decrease in egg production in layers, decrease in hatchability, neurologic signs in chicks, and survivors are considered unprofitable. This study aimed to determine the prevalence of Avian Encephalomyelitis virus antibodies and the prevalence rate in commercial layer belt of Tamil Nadu. The outcome of this study may help in formulating a control policy of the disease.

Materials and Methods
A total of seventeen commercial layer flocks from different locations in commercial layer belt of Tamil Nadu were selected for this study. Blood samples were aseptically taken by vein puncture of wing veins from birds which had not been vaccinated against avian encephalomyelitis. Serum was extracted by centrifugation at 1,500 × g for 10 min at 4°C and then inactivated at 56°C for 30 min and kept at −20°C before use. A total of 32 sera samples from chicks, 150 sera samples from growers and 738 sera samples from layers were screened for avian encephalomyelitis virus (AEV) antibodies. Sera samples were screened individually by using a commercial direct ELISA kits. The percentage of seropositivity and geometric mean titres (GMT) were calculated and titres greater than 396 were considered positive and indicated exposure to these organisms as per manufacturer’s recommendation.

Results and Discussion
The overall prevalence rate of AEV antibodies in different Localities of commercial layer belt of Tamil Nadu state was 79.35% (Table 1 and 2). This is higher than Zahraa et al., 2010 findings, who reported prevalence rate of 57.1% AEV antibodies in different localities of Khartoum, Sudan. The per cent seropositivity of chicks, growers and layers were 28.13, 40.67 and 89.43

1Corresponding author : Email : drsugu@gmail.com
respectively (Table I and Fig. 1). The seroprevalence was found to be higher among layers followed by growers and chicks. The examined layer flocks had no clinical signs, or noticeable drop in egg production. The detection of avian encephalomyelitis antibodies indicates that these flocks were exposed to a field strain of avian encephalomyelitis virus.

The prevalence of AEV antibodies in all locations screened indicated that there was a circulating field virus among farms, nevertheless, no vaccine applied against this disease. All of the layer flocks studied were reared in the open system of husbandry. The high prevalence of AEV antibodies was recorded in the sites where the farms were close to each other and one farm had birds of multiage groups.

Avian encephalomyelitis virus has the ability to spread horizontally and vertically. Direct bird-to-bird contact and exposure to contaminated personal and fomite might be the sources of horizontal transmission. Vertical transmission also plays an important role in the spread of the AEV. Deshmukh et al. (1971) in his survey of AEV in turkey breeder flocks in Minnesota, USA used the embryo susceptibility test and showed that the AEV infection in turkey breeder flocks was quite widespread, however, the prevalence of clinical signs of AE in turkey poult's was quite low. Cadman et al. (1994) detected anti AEV antibodies as 15% prevalence by ELISA in Ostriches (Struthio camelus) in Zambabwe.

To the best of our knowledge, it is worth to mention that this is the first study on the detection of AEV antibodies in non vaccinated layer

### Table I. Seroprevalence of Avian encephalomyelitis in different localities of Namakkal district, Tamil Nadu

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Name of the Farm and location</th>
<th>Number of sera samples collected</th>
<th>Number of Positive</th>
<th>Number of Negative</th>
<th>Percent positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>AMR Pf. Allapuram</td>
<td>50</td>
<td>49</td>
<td>1</td>
<td>98</td>
</tr>
<tr>
<td>2.</td>
<td>Bharathi Pf. Mudalsipatty</td>
<td>17</td>
<td>17</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>3.</td>
<td>KL Pf. Aniypuram</td>
<td>68</td>
<td>56</td>
<td>12</td>
<td>82.35</td>
</tr>
<tr>
<td>4.</td>
<td>Ramakrishna Pf. Thalvapalyam</td>
<td>308</td>
<td>228</td>
<td>80</td>
<td>74.02</td>
</tr>
<tr>
<td>5.</td>
<td>Thirumurthi Pf.</td>
<td>10</td>
<td>7</td>
<td>3</td>
<td>70</td>
</tr>
<tr>
<td>6.</td>
<td>Ponni Pf. Avalnaickenpatty</td>
<td>152</td>
<td>71</td>
<td>81</td>
<td>46.71</td>
</tr>
<tr>
<td>7.</td>
<td>Sai Pf, Kavunthapadi</td>
<td>12</td>
<td>11</td>
<td>1</td>
<td>91.66</td>
</tr>
<tr>
<td>8.</td>
<td>NT Pf, Vellakkalpatty</td>
<td>17</td>
<td>17</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>9.</td>
<td>Periyasamy Pf, Vellakkalpatty</td>
<td>35</td>
<td>41</td>
<td>6</td>
<td>85.36</td>
</tr>
<tr>
<td>10.</td>
<td>Chinnadurai Pf, Vellakkalpatty</td>
<td>18</td>
<td>16</td>
<td>2</td>
<td>88.8</td>
</tr>
<tr>
<td>11.</td>
<td>GLD Pf, Eryampatty</td>
<td>25</td>
<td>23</td>
<td>2</td>
<td>92</td>
</tr>
<tr>
<td>12.</td>
<td>Sasianand Pf, Karukkampalyam</td>
<td>92</td>
<td>73</td>
<td>19</td>
<td>79.34</td>
</tr>
<tr>
<td>13.</td>
<td>Chellam, Nallur</td>
<td>17</td>
<td>24</td>
<td>7</td>
<td>70.83</td>
</tr>
<tr>
<td>14.</td>
<td>Chellam, Parali</td>
<td>25</td>
<td>24</td>
<td>1</td>
<td>96</td>
</tr>
<tr>
<td>15.</td>
<td>Anbu, Aniypuram</td>
<td>35</td>
<td>35</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>16.</td>
<td>Sellappan, Aaniyur</td>
<td>14</td>
<td>14</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>17.</td>
<td>Karthick, Kandampalayam</td>
<td>25</td>
<td>24</td>
<td>0</td>
<td>96</td>
</tr>
</tbody>
</table>
Incidence of Avian Nephritis From Commercial Broiler Flocks in Palladam Region of Tamil Nadu

K.Sukumar and P.Sumitha

Department of Veterinary Microbiology, Veterinary College and Research Institute, Namakkal-637002.

(Received : 26-05-2015;    Accepted : 16-07-2015)

Abstract

Avian nephritis virus (ANV) is known as a potential causative agent of the baby chick nephropathy. In this study, kidney samples from one to two week-old broiler chicks diagnosed with acute nephritis and gout were subjected to an RT-PCR assay for the molecular confirmation of ANV. The detection of ANV specific nucleic acids in the specimen (amplicon size 182 bp) in broiler chicks indicates that this virus is probably endemic in the flocks or the environment. This study represents the first detection of ANV from broiler from Namakkal district of Tamil Nadu.

Key words: Avian nephritis, kidney, broiler chicks

Nephropathy and subsequent gout is a frequent cause of mass losses in the poultry industry. Among the agents that play a role in the aetiology of the disease, avian nephritis virus (ANV) which is now classified as an avian astrovirus on the basis of its genome sequence, is associated with acute, highly contagious, but typically subclinical disease in chickens. Young chickens are the only animals to develop clinical disease and distinct kidney lesions when exposed to ANV (Shirai et al., 1991). Under field conditions, clinical signs associated with this virus infection in broiler chickens vary from none (subclinical) to outbreaks of the so-called runting syndrome and baby chick nephropathy (Goodwin et al., 1993)

Besides ANV, several factors can cause gout in chicken. Among the noninfectious ones, inadequate water supply or cold can result in uricosis. Vitamin A deficiency or mycotoxin in the food might cause nephrosis, and finally uricosis too. Infections of certain nephro pathogenic strains of infectious bronchitis virus (IBV) also result in nephrosis and interstitial nephritis. All of these changes end up finally as gout; therefore, the differential diagnosis of ANV infections is difficult or not possible merely on the basis of the morphological and histological lesions. The isolation of the virus takes longer time and sometimes result are inconclusive. The present paper describes an incidence of avian nephritis in broiler flocks in layer belt of Tamil Nadu state using ELISA test. Further studies are warranted to evaluate the clinical status of AE in the Tamil Nadu to formulate a control policy of the disease.

References


