Prevalence of infectious diseases in local and fayoumi breeds of rural poultry (Gallus domesticus) under climate change scenario

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Abstract

A field research was carried out to investigate the prevalence of the poultry diseases in rural fowl in the sil Paharpur, district Dera Ismail Khan during 2016. Data recording sample was kept 300 sick / dead Desi (local breed) and Fayoumi hens. Symptoms of diseases and postmortem examination of the effected birds was done as per prescribe medical diagnosis procedure. For differentiation between bacterial and viral diseases, McConkey agar media protocols were adopted in the laboratory at Veterinary Research Centre, Dera Ismail Khan. The growth process of diseases was carried by incubating the suspected materials at 37°C for 24-28 hours. Sugar fermentation and biochemical tests were applied as per recommended procedure and the results were analyzed statistically using simple score test method. The disease prevalence was found high (55.72%) in Fayoumi than local breed i.e., Desi hens (44.28%). The overall prevalence of various diseases was as such, Newcastle (31.33%), salmonellosis (8.66%), collibacillosis (7%), coccidiosis (2.33%), fowl pox (7.55%), water belly (0%), infectious coryza (12%), infectious bronchitis (8%), chronic respiratory disease (13%) and avian influenza (10.13%). The increased incidence of diseases over the past can be attributed to the climate change in the area of study. Hence it is recommended that beside proper management and vaccination, exploration of new strategies to cope with the climate change is direly needed for sustainability of poultry industry.

Keywords: Viral infections, Bacterial infections, Prevalence, Poultry diseases, Fowl pox

1. Introduction

Pakistan is an agriculture country having more than 70% population in villages. Their lives mainly depend upon livestock and agriculture. Women in villages are particularly involved with rearing poultry for income making by selling birds and their eggs. Poultry not only plays an important role in diminishing the difference between the supply and demand of health protein of animal source but also provides an effective mean of income generation in small range. The poultry industry has been ranked an important sub-sector of the agriculture (Mushtaq, 1994)[10]. According to the Economic survey of Pakistan (2005-06), the variety of Fayoumi and Desi hens are 36.5 million. Although poultry organization has developed with an instant quickness however, many some infectious diseases possess a serious risk for the survival of poultry farming especially at small scale. Several infectious and non-infectious diseases have vast prevalence in poultry inflicting heavy economic losses (Qureshi, 1981)[14]. The major poultry disease include collibacillosis, Newcastle disease, infectious bronchitis, coccidiosis, enteritis, infectious Coryza, fowl pox, hydropericardium syndrome, salmonellosis and avian influenza (Vyslouzil and Dhonal, 1988[16]; Javed et al., 1994[5]; Khan et al., 2000[7]; Bano et al., 2003[3]).
The diseases spread around in rural poultry due to poor feed, housing, vaccination and also through wild birds (Khawaja et al., 2005)\(^8\). Although, several researches have been conducted to find out the prevalence of the poultry disease at provincial (Ikhwan and Shamshir, 1994)\(^6\), national (Anjum, 1990)\(^3\) and international (Malkani et al., 1998)\(^9\) level but no research study has been conducted in tehsil Paharpur district Dera Ismail Khan regarding the prevalence of the home rearing or small scale poultry diseases. Therefore, the present research was conducted to investigate the prevalence of different diseases that will provide baseline data for effective control and protection of infectious diseases in rural poultry.

2. Materials and Methods
For the purpose of current field study, a total of 300 sick and tired /dead Desi (local breed) and Fayoumi hens were examined during 2016 in and around tehsil Paharpur. The medical diagnosis of the diseases was done through observing symptoms and postmortem examination of the effected birds. The bacterial and viral diseases were differentiated in the laboratory at Veterinary Research Centre, Dera Ismail Khan, by examining the growth on McConkey agar by incubating the suspected materials at 37°C for 24-28 hours. The growth obtained was determined by various sugar fermentation and biochemical tests following methods explained by Coles and Miles (1989)\(^4\). The results were analyzed statistically using simple score test (Nam, 1995)\(^12\).

3. Results and Discussion
In such a research, results obtained regarding overall prevalence of various diseases in two breeds reared domestically in rural areas were found more (55.72%) in Fayoumi than Desi hens (44.28%). The overall incidence of different diseases was noted, Newcastle (31.33%), salmonellosis (8.66%), collibacillosis (7%), coccidiosis (2.33%), fowl pox (7.55%), infectious coryza (12%), infectious bronchitis (8%), chronic respiratory disease (13%) and avian influenza (10.13%). No cases of water belly were found in both the breeds. The prevalence of many diseases recorded in Fayoumi hens were Newcastle (17%), salmonellosis (5.63%), collibacillosis (4.50%), coccidiosis (1.10%), fowl pox (3.45%), infectious coryza (7.45%), infectious bronchitis (3.88%), CRD (7.65%) and avian influenza (5.06%). In Desi hens the prevalence of diseases recorded was Newcastle (14.33%), salmonellosis (3.03%), collibacillosis (2.50%), coccidiosis (1.23%), fowl pox (4.10%), infectious coryza (4.55%), infectious bronchitis (4.12%), CRD (5.35%) and avian influenza (5.07%).

It has been observed in this research that Newcastle disease was found to be the major disease in rural poultry in Fayoumi than Desi hens while fowl pox was high in Desi than Fayoumi hens as shown in Table 1.

Table 1: Prevalence of various infection diseases in Fayoumi and Desi breeds of poultry with their frequencies.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Frequency</th>
<th>Percent</th>
<th>Fayoumi</th>
<th>Desi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newcastle disease (ND)</td>
<td>106</td>
<td>31.33%</td>
<td>17.00%</td>
<td>14.33%</td>
</tr>
<tr>
<td>Salmonellosis</td>
<td>15</td>
<td>8.66%</td>
<td>5.63%</td>
<td>3.03%</td>
</tr>
<tr>
<td>E. coli</td>
<td>14</td>
<td>7.00%</td>
<td>4.50%</td>
<td>2.50%</td>
</tr>
<tr>
<td>Coccidiosis</td>
<td>29</td>
<td>2.33%</td>
<td>1.10%</td>
<td>1.23%</td>
</tr>
<tr>
<td>Fowl pox</td>
<td>36</td>
<td>7.55%</td>
<td>3.45%</td>
<td>4.10%</td>
</tr>
<tr>
<td>Water Belly</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Infectious coryza</td>
<td>20</td>
<td>12.00%</td>
<td>7.45%</td>
<td>4.55%</td>
</tr>
<tr>
<td>Infectious bronchitis ( IB)</td>
<td>9</td>
<td>8.00%</td>
<td>3.88%</td>
<td>4.12%</td>
</tr>
<tr>
<td>Chronic respiratory disease (CRD)</td>
<td>15</td>
<td>13.00%</td>
<td>7.65%</td>
<td>5.35%</td>
</tr>
<tr>
<td>Avian influenza</td>
<td>6</td>
<td>10.13%</td>
<td>5.06%</td>
<td>5.07%</td>
</tr>
<tr>
<td>Total</td>
<td>250</td>
<td>100.00%</td>
<td>55.72%</td>
<td>44.28%</td>
</tr>
</tbody>
</table>

The diseases are prevalent due to improper vaccination and through contact with wild birds which are not vaccinated for these diseases and also from migratory birds. The results are related to the results of Khan et al. (2006)\(^7\), Vyslouzil and Dohnal (1988)\(^14\). The other major disease found during the study was chronic respiratory disease (CRD) whose findings were almost in conformity with those reported by Pervaz et al. (1987)\(^13\) & Khan et al. (2000)\(^7\). Chronic respiratory disease (CRD) was found one of the major health problems of rural poultry. In spite of advances made in prevention, control still appears to be a problem in Pakistan (Qureshi, 1981)\(^14\). This disease is relates to poor management and sanitary conditions and can be reduced through proper management and preventive measures.
Infectious coryza disease was also found high in Fayoumi than Desi hens which is because of cold season, improper housing without proper ventilation and close contact of wild birds. The results are in accordance with Khan et al. (2000)[7]. Other diseases almost having similar prevalence rate in both Fayoumi and Desi hens. Infectious diseases of viral origin especially, their incident could be due to unhygienic conditions, poor vaccination, poor brooding arrangements, poor preventive measures, lack of interval between successive crops, contaminated feed, water and poor knowledge about rearing the poultry on scientific basis.

![Fig 1: Prevalence of various infection diseases in Fayoumi and Desi breeds of poultry with their frequencies](image)

**Fig 1**: Prevalence of various infection diseases in Fayoumi and Desi breeds of poultry with their frequencies

### 4. References
