AN OUTBREAK OF MAREK’S DISEASE IN BROILER CHICKENS: EPIDEMIOLOGICAL, CLINICAL AND ANATOMOPATHOLOGICAL ASPECTS

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Summary

Marek’s disease, even if it is an infectious disease noted for a long time, continues to be loss-making in the farms of broiler chickens, although there are vaccines, which are administrated in the first day of life.

The researches from this article aim to study the epidemiological characteristics, clinical findings and necropsy findings in Marek’s disease, which evolved in an effective of broiler chickens.

The epidemiological exam of the effective revealed that the relative grave evolution in Marek’s disease was possible because the broiler chickens haven’t been vaccinated against Marek’s disease. The cumulative mortality of broiler chickens was of 12.06 % by beginning with the fourth week of life, from which 9 % pursuant to the evolution of Marek’s disease in the effective. In histopathological examination it was noted high cellular polymorphism: lymphocytes, limphoblasts, fibroblasts, and red cells and tumoral infiltrations focal or diffuse.

Key words: Marek’s disease, epidemiological, clinical, anatomopathological aspects

Although Marek’s disease is an infectious disease known for a long time continue to produce losses in the broiler farms, although there are vaccines that are administered from the first day of life.

The researches have been performed to study the epidemiological characteristics, clinical and anatomopathological findings in Marek's disease, which has evolved in an effective of broilers.

Materials and methods

In the farm taken in the study, in Arad County, have been reported losses by mortality and changes in weight increase in broiler chickens.

Epidemiological examination was carried out as epidemiological survey, aiming at the objectives:
- identify the source of infection;
- detecting favorable factors and ways for the spread of disease outside the farm;
- broilers origin, race, age category, the kind of exploitation;
- the types of shelters and their location, microclimate in the shelters;
- the quantity of feed given in relation to physiological needs and quality of feed;
- data on the immunological status of the effective;
- changes in weight increase, assessed by weekly weighing;
- calculation of cumulative mortality, for economic losses quantification.

Anatomoclinical and epidemiological investigations have been conducted in farm and laboratory examinations were conducted in the Discipline of Infectious Diseases FMV Timisoara and in the SN Institute Pasteur S.A. Bucharest.

This outbreak was registered in the S farm, in the Arad County, specialized in broilers’ raising, and usually chicken import from. In a series of 12 000 broiler chickens, were recorded losses through mortality, in two halls of chickens raised to the ground.

In the two halls of broiler chickens were carried out survey clinical examinations of the existing effective and individual detailed clinical examinations of the broiler chickens with clinical signs.

Anatomopathological examination was realized twice a week in all chicken corpses of the day, being noted anatomopathological macroscopic lesions. Of the organs with lesions were made histological preparations, in order to establish the diagnosis of disease.

The samples collected were treated with 10% formalin, embedded in paraffin, after which they were cut by microtome (5µm) and colored using HE (hematoxylin eosin) method. The sections such colored were examined under a microscope for evidence of the histological changes (5).

Results and discussions

Study on the broiler farm has provided important data with practical utility as regards Marek’s disease development in the Western part of Romania. In broiler effectives, Marek’s disease is quite rare and some authors do not recommend their vaccination in the first days of life (2) because the disease would not appear until the age of 42-45 days, when they are slaughtered. The opinion of other authors is that only the morpho-clinical manifestations are not obvious to remark until that age, but the microscopical lesions are present and they have negative effects on growth and development of broiler chickens (3, 5).

According to data from literature (1), currently in the field there are circulating strains of the Marek virus very virulent marked with + vv (very virulent +) which even in contact with immunized effectives can reproduce the disease.

The effective of broiler chickens taken in the study, hybrid Ross 308, grown to the soil, was distributed in two halls, each of 6000 broilers. Import chickens came from Hungary. In the first three weeks of life of broilers, the mortality losses were about 1%. Since the fourth week of life of broilers, the total mortality losses increased to 4.15%. In this farm, biosecurity and general prevention measures are partially applied. In broiler chickens from that series there was conducted vaccination against Newcastle disease and infectious avian bursitis.

Evolution of mortality in Marek’s disease in the broilers from S farm, Arad County, is given in Table 1 and Figure 1.
Table 1

The evolution of cumulative mortality in broiler chickens

<table>
<thead>
<tr>
<th>Week</th>
<th>H I No. dead broilers</th>
<th>%</th>
<th>H II No. dead broilers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>35</td>
<td>0.58</td>
<td>37</td>
<td>0.61</td>
</tr>
<tr>
<td>II</td>
<td>63</td>
<td>1.05</td>
<td>78</td>
<td>1.3</td>
</tr>
<tr>
<td>III</td>
<td>73</td>
<td>1.21</td>
<td>89</td>
<td>1.48</td>
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<td>IV</td>
<td>249</td>
<td>4.15</td>
<td>238</td>
<td>3.96</td>
</tr>
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<td>V</td>
<td>175</td>
<td>2.91</td>
<td>154</td>
<td>1.28</td>
</tr>
<tr>
<td>VI</td>
<td>129</td>
<td>1.07</td>
<td>112</td>
<td>0.93</td>
</tr>
<tr>
<td>Total</td>
<td>724</td>
<td>12.06</td>
<td>708</td>
<td>11.8</td>
</tr>
</tbody>
</table>

Fig.1. The evolution of cumulative mortality in broiler chickens

In the 6 weeks as it took the survey of broilers effective were recorded mortality losses of 12.06% in Hall I and 11.8% in Hall II. In literature (2, 4) there is mentioned the possibility of such losses due to Marek's disease, even in immunized effectives, because it could be selected very pathogenic viral strains.

In the first three weeks of life of broilers, the effective hasn’t presented clinical manifestations to draw attention to the existence of particular health problems. From the fourth week there were noticed depression, pale comb and wattle, inappetence, reduced feed consumption and changes in weight increase. All these are correlated with increased percentage of mortality in the two halls.

Following necropsy examinations performed in broiler corpses there have been found only the volume and weight increasing of parenchymatous organs (liver and spleen). There haven’t been found other macroscopic lesions, on the skin and nervous system.
In broiler chickens, the histopathological examination revealed a high growth in the number of leucocytes (lymphocytosis) with occurrences of immature lymphoid elements. The proportion leucocytes / erythrocytes were as much in favor of leucocytes.

It was also observed an appreciable number of fibroblasts with cellular mitosis, hyperplasia of capillary and small vessels adventice followed by their differentiation in lymphoid direction - perivascular tumoral hyperplasia.

In sections of spleen and liver, it is markedly the cellular accentuated polymorphism: lymphocytes, lymphoblasts, plasmablasts, fibroblasts among red blood cells and tumor infiltrations circumscribed or diffuse.

Infiltrative increase is accompanied by degeneration or necrosis of specific functional elements (cells - liver ducts) of surrounding areas. Liver ducts near the large foci are partly atrophicated or degenerated, with vacuolization.

The visceral form of Marek’s disease diagnosis, suspicion based on clinical signs and macroscopic lesions, was confirmed by histological examination too.

**Conclusions**

This study shows that Marek’s disease virus has caused significant losses in the broiler chickens.

The evolution relatively severe of Marek’s disease was possible because neither of the two effectives was vaccinated against Marek’s disease.

In case of broiler chickens, cumulative mortality recorded values of 12.06% beginning from the fourth week of life, of which 9% because of Marek’s disease evolution in the effective.

Anatomopathological examination revealed characteristic lesions of the visceral acute form of Marek’s disease.

At histological examination, there was noticed accentuated cellular polymorphism: lymphocytes, lymphoblasts, plasmablasts, fibroblasts among red blood cells and tumor infiltrations circumscribed or diffuse, which sometimes do not allow the organ of origin microscopic identification.

**References**