INFLUENCE OF BIO-MIX ON THE VISCERAL ORGANS DURING BACTERIAL ENTERITIS IN BROILER CHICKENS

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ABSTRACT

Bio-Mix (Tinospora based multiherb extract) was used against bacterial enteritis. Bacterial enteritis was experimentally induced in 60 chicks by the oral administration of 2 ml E. coli and Salmonella typhi suspension (10^9 organisms/ml) while 30 chicks (group C) were kept as control. From the next day group A (30 chicks) was treated with Bio-Mix @100gm/50kg feed for 5 days and B group (30 chicks, untreated with Bio-mix) was kept as control. The diseased birds of group B showed increased weight of liver due to bacterial infection, as compared to group A and C. The weight of spleen was non-significantly increased within group B and was comparable to group A and C. Non significant difference in the mean heart weight of three experimental groups of chicks was observed at the age of 28 and 32 days.

Key words: Poultry, enterobactereaceae, E. coli, Salmonella, bacterial enteritis, biomix

INTRODUCTION

Poultry industry plays a vital role in the economy of Pakistan. It contributes greatly to the national requirement for the protein as indicated in an economic survey by the Government. The whole sale price of eggs and broiler declined by 32% and 14% respectively during the decade 1983-1993, while that of mutton and beef increased by 34% and 75% respectively. The peak year for this industry was 1997 when a total of 3.6-million broiler parent stock was placed. The industry was adversely affected by imposition of 12.5% tax on feed (Anonymous, 2000a). Recently a Government restriction on marriage feasts was said to be responsible for a drop in chicken meat consumption resulting in a serious fall in broiler meat price, but more serious is believed to be worsening disease situation and increasing average mortality in both layer and broiler flocks (Anonymous, 2000b).

Among these diseases enteritis is a common cause of mortality in poultry that may some time assume serious proportions, there is profuse diarrhoea and at postmortem examination duodenum shows congestion of mucosa along with displaced microvilli. (Chauhan and Roy, 1996). This disease is also associated with the necrosis of absorptive surface of small intestine and liver in the affected flock. Mortality is low but in some cases it may reach as high as 1% per day (Wilson, 1998). In acute outbreaks mortality may reach 10%. Enteritis causes mortality in rapid growth phase and thus leads to the loss of birds (Lister, 1997). There are many antibiotics available in the market which are used against enteritis but these are cost affective and act in one way against these microorganisms.

MATERIALS AND METHODS

Ninety chicks of one-day age were kept under standard experimental and hygienic conditions in the poultry lab. of NIAB, Faisalabad. The birds were randomly divided into 3 experimental groups A, B and C comprising 30 chicks each. To each group calculated amount of feed and adlibitum water was provided. Vaccination against ND, IBD and Hydropericardium diseases were carried out as per schedule. When the chicks were of 14 days, 2ml of bacterial suspension having 10^9 organisms of pathogenic E.coli and Salmonella per ml were orally given to each chick of group A and B. These enteropathogenic E.coli and Salmonella were already isolated from the chicks suffering from bacterial enteritis. About 140ml of this bacterial culture was also added to the drinking water of group A and B in order to inoculate a high concentration of these microorganisms. From the next day of inoculation the chicks of group A were treated with Bio-Mix @ 2gm/kg feed for 5 days. The chicks of group C served as control. This group was neither induced by bacterial enteritis nor treated with Bio-Mix. The main purpose of the study was to observe the effect of Bio-Mix against bacterial enteritis on the visceral organs. So in order to record the weight of internal organs sampling was done at the interval of 5 days. At each sampling 5 chicks from each experimental group were slaughtered to obtain the mean values. On postmortem weight of heart, liver and spleen were recorded by a balance. The data of all the experimental groups were tested by analysis of variance and differences in various treatment groups were worked out by using LSD test at (P<0.05).
RESULTS

a) Liver Weight:

The mean liver weight at the age of 28 days was maximum in group B (28.92 ± 3.16) followed by group A (23.59 ± 3.27) and group C (22.36 ± 2.54) g in group A, B and C, respectively. The mean liver weight at the age of 32 days increased in all groups i.e., 32.91 ± 2.20 in group A, 34.66 ± 3.54 in group B and 32.00 ± 1.77 g in group C. It was observed that there was a significant difference in the weight of liver between the diseased and treated groups at the age of 28 days. At the 2nd sampling stage the liver weight was greater in diseased birds (34.66± 3.54) than the treated (32.91±2.20) and control birds (32.00± 1.77) g, but the difference between the weight of liver of diseased and treated birds was non significant.

Table 1. Effect of biomix on visceral organs of chicks.

<table>
<thead>
<tr>
<th>Age (days)</th>
<th>Group</th>
<th>Liver weight (g)</th>
<th>Spleen weight (g)</th>
<th>Heart weight (g)</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>A</td>
<td>27.47± 3.27</td>
<td>0.86± 0.27</td>
<td>6.01± 0.94</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>28.92± 3.16</td>
<td>0.99± 0.46</td>
<td>5.02±0.52</td>
<td>0.0118*</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>22.36± 2.54</td>
<td>0.89± 0.14</td>
<td>5.97± 0.45</td>
<td>0.3004NS</td>
</tr>
<tr>
<td>32</td>
<td></td>
<td>32.91±2.20</td>
<td>1.36 ± 0.42</td>
<td>7.90 ± 1.55</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>34.66±3.54</td>
<td>1.58 ± 0.68</td>
<td>6.36 ± 1.19</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>32.00 ± 1.77</td>
<td>1.12 ± 0.15</td>
<td>7.86 ± 1.60</td>
<td></td>
</tr>
</tbody>
</table>

NS = Non significant; * = Significant

b) Spleen Weight:

The weight of spleen was also recorded that was maximum in-group B (0.99 ± 0.46) followed by group A (0.86 ± 0.27) and then group C (0.89 ± 0.14) g, when the chicks were of 28 days. At the age of 32 days these values reached to 1.36 ± 0.42, 1.58 ± 0.68 and 1.12 ± 0.15 g in group A, B, and C respectively.

c) Heart Weight:

At the age of 28 days the mean values of heart weight were minimum in group B (5.02 ± 0.52) then group C (5.97 ± 0.45) and was highest in group A (6.01 ± 0.94) g. On the 32nd day group A, B and C had heart weight of 7.86 ± 1.60, 7.90 ± 1.55 and 6.36 ± 1.19 g respectively.

DISCUSSION

The mean liver values at the age of 28 days in group A, B and C were 23.9± 3.27, 28.92± 3.16 and 2.54g respectively. The liver of group B had significantly (P<0.01) increased weight, due to bacterial enteritis, infectious disease of E. coli and Salmonella, while no significant difference was observed in the liver weight of group A and C, as A group was treated with Bio-Mix and Group C served as control. Snoeyenbos et al. (1984) reported that during the Salmonella infection, the liver becomes enlarged. Similar increase in the size was reported by Peerzada (2000) during the E.coli infection (Table 1).

During the experimental period, the weight of spleen was non-significantly increased in group B induced with pathogenic E.coli and Salmonella and was comparable to group A and C. During the infection of S.typhi the size of spleen become enlarged (Table 1). Non significant difference in the mean heart weight of three experimental groups
of chicks was observed at the age of 28 and 32 days. When \textit{E.coli} enters in circulatory system, it can cause the congestion of veins (Simon and Shane, 1997), the stress damages the heart (Table 1). It was found that \textit{Salmonella} and \textit{E.coli} increases the weight and size of visceral organs of chicks. Bio-mix was found effective for the control of visceral organ enlargement.

REFERENCES


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