

Animal Health Research Institute.
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STUDIES ON SOME BACTERIAL AGENTS CAUSING MORTALITIES IN QUAIL FARMS IN KENA PROVINCE

(With 3 Tables)

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دراسات عن بعض المسببات البكتيرية للنفوق في السمان في محافظته قنا

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تم فحص عدد ٨٥ (٧-٤٠ يوم) من السمان النافقة حديثاً من مزارع مختلفة بمحافظة قنا، وقد لوحظ على الطيور المصابة ضعف وانكماش وتأخر في النمو بالإضافة إلى وجود اسهال أبيض مصفر بينما كانت أهم الآفات التشريحية هي احتقان في الأعضاء الداخلية وعدم امتصاص كيس المح، وقد تم عزل ٢٩ حالة علي النحو الآتي، ١٠ معزولات من الميكروب القولوني ، ٧ معزولات من السالمونيلا باللورم، ٥ معزولات من ستافيلوكوكس ايرويس، ٤ معزولات من ستافيلوكوكس ابيديرميدس، ٢ معزولتين من السالمونيلا تيفيميوريم وكذلك معزولة واحدة من باسيلس سيريس بالنسب المئوية التالية ١١,٨%، ٨,٢%، ٥,٩%، ٤,٧%، ٢,٤%، ١,٢% على الترتيب و بإجراء العدوى الصناعية للميكروب القولوني في السمان عمر ٣ يوم عن طريق الفم وصلت نسبة النفوق الي ٧٠% وكانت الأعراض والصفة التشريحية متماثلة مع تلك التي لوحظت في حالات الإصابة الطبيعية وقد تم إعادة عزل الميكروب مرة أخرى من السمان المعدية صناعياً وبأجراء اختبار الحساسية على ١٠ معزولات من الميكروب القولوني وجد أنها جميعاً عالية الحساسية لكل من الأنتروفلوكساسين الدانوفلوكساسين والفلوموكين والجينتاميسين بينما كانت ٩ معزولات من السالمونيلا حساسة لكل من الأنتروفلوكساسين والدانوفلوكساسين والفلوموكين والجينتاميسين واللينكوميسين وكذلك الكلورامفينكول.

SUMMARY

A total of 85 freshly dead (growing quails 7-40 days) collected from different farms of kena province. The clinical signs of the infected quails were sever weakness, depression, retardation of growth as well as whitish diarrhoea, while the most postmortem lesions were sever congestion of the paranchymatous organs and unabsorbed yolk sac. Isolation revealed 29 isolates of positive cases. The isolates were as

follows, 10 *E. coli*, 7 *S. pullorum*, 5 *Staph. aureus*, 4 *Staph. epidermidis*, 2 *S. typhimurium* and 1 *B. cereus* respectively with an incidence of 11.8%, 8.2%, 5.9%, 4.7%, 2.4% and 1.2%. Trails for reproducing the infection in 3 day old quails lead to 70% mortality. The clinical observation and postmortem lesions were similar to great extent to those of natural infection. Reisolation of the inoculated organism from dead quails were conducted. In vitro antibiotics sensitivity test showed that the examined of *E. coli* isolates were highly sensitive to enrofloxacin, danofloxacin, flumequin and gentamycin while enrofloxacin, danofloxacin, flumequin, gentamycin, lincomycin and chloramphenicol against *Salmonella* isolates.

Key words: *Bacterial agents, mortality, quail.*

INTRODUCTION

Poultry meat is considered one of the most important source of animal protein. Nowadays, a great attention was payed towards quail farms as a trail to excessive demands of an increased population from animal protein. Quails are one of the most important human nutrition sources due to high quality animal protein and other food elements (Stadelman and Cotterill, 1995).

Moreover, quails have been known for their good taste and delicacy also it has very low cholesterol contents making it a suitable source of protein of high biological value (Huchzermeyer, 1997).

Quails and other migratory birds play a considerable role in dissemination of many pathogens and act as a reservoir and carrier of microbial agents for domestic birds and human (El-Attar *et al*; 1997).

Bacterial infection of birds are of great importance regarding its epidemics which may spread among poultry flocks causing mortality in all ages, loss of marketability and lowering of egg production.

In the recent years, considerable attention has been directed to the role of opportunistic bacteria with special reference to gram-negative as a saprophytes in quails environments.

So this work was planned to isolation and identification of the most common bacterial agents which may responsible for mortality in quail farms at Kena province, experimental infection of young quails with the common isolated organism, in addition to testing the isolates against several antibiotic discs.

MATERIALS and METHODS

1-Samples:

A total of 85 samples were collected from clinically diseased and freshly dead quail of different ages at Kena province. The collected samples were packed in box and aseptically transferred to the laboratory without delay where they were immediately examined for bacterial isolations.

2-Bacteriological examination:

The samples of freshly dead quails were taken aseptically from all internal organs including liver, heart, spleen, lung, kidney, yolk sac and intestine as well as swabs were taken from living quails. All samples were inoculated into selenite F.broth as well as nutrient broth (Difco) and incubated for 18 hours at 37°C for selenite F.broth and 24 hours at 37°C for nutrient broth. The subcultured onto blood agar, nutrient agar and macConkey agar plates(Difco) and incubated for 24-48 hours at 37°C, suspected colonies were picked up and isolated in pure culture for further identification according to (Quinn *et al*; 2002).

3-Experimental infection:

Twenty, 3-day old quails obtained from private farm, Kena province, were used in this study, quails were observed and proved to be free from pathogenic organisms by taking a random sample subjected to clinical, postmortem examination as well as bacteriological examination. 3×10^8 colony forming unite adjusted by Macferland density technique of viable identified organisms of *E.coli* (Finegold and Baron, 1986) were inoculated orally in 3-day old quails. Symptoms appeared on infected birds were recorded. The dead quails were undergos postmortem findings and reisolation of the causative agents.

4-In vitro. Sensitivity:

The isolated of *E.coli* and *Salmonella* strains were examined for their susceptibility to the different antibiotics. The paper disc technique was carried out after (Finegold and Baron, 1986) Enrofloxacin (10ug), Danofloxacin (5ug), Tetracycline (30ug), Colistin sulphate (10ug), Flumequin (30ug), Ampicillin (10ug), Gentamycin (10ug), Lincomycin (2ug), Naladixic acid (30ug), Streptomycin (10ug) and Chloramphenicol (10ug) were employed.

RESULTS

The clinical signs observed in the diseased quails were severe weakness, depression, retardation of growth as well as whitish diarrhea, while the postmortem lesions were severe congestion of paranchymatous organs and unabsorbed yolk sac. The relative incidence of the recovered bacterial isolated was shown in Table (1). 29 isolates as follows, (10) *E.coli*, (7) *S.pullorum*, (5) *Staph.aureus*, (4) *Staph.epidermidis*, (2) *S.typhimurium* and (1) *B.cereus*, with an incidence of 11.8%, 8.2%, 5.9%, 4.7%, 2.4% and 1.2% respectively.

As shown in Table (2), chicks of group (1) revealed 70% mortality within 5 days postinoculation. experimentally chicks showed clinical signs in the form of depression, weakness, ruffled feathers and diarrhea, postmortem lesions were severe of paranchymatous organs and unabsorbed yolk sac. The control group was remained apparently healthy through the experimentally period and showed no clinical signs.

The results of antibiogram on the *E.coli* isolates revealed that enrofloxacin, danofloxacin, flumequin and gentamycin were the most effective while *Salmonella* isolates were highly sensitive to enrofloxacin, danofloxacin, flumequin, gentamycin, lincomycin and chloramphenicol (Table 3).

DISCUSSION

Bacterial infections of quails are of great importance due to epidemics and may spread among poultry flocks causing mortality in all ages. Poultry bacterial pathogens such as *E.coli* and *Salmonella* species are the most common important bacterial infections that causes economic losses in poultry industry as well as they are of public health hazard (El-Gharib *et al*; 1993) and (Lin and Chin-ling, 1996).

In this study, bacteriological examination revealed that the prevalence of *E.coli* from most examined samples in a total percentage of 11.8%, *Salmonella pullorum*, *Salmonella typhimurium* with an incidence of 8.2% and 2.4% respectively. Those gram negative organisms might be the probable cause of enteritis, septicemia (Steiner and Davis, 1981) and pneumonia (Gerlach, 1986). These results were somewhat similar to those recorded by (El-Attar *et al*; 1997) who isolated *E.coli*, *Salmonella typhimurium* with an incidence of 18.1% and 5.5% respectively. Regarding to the gram positive bacteria in this study *Staph. aureus*, *Staph. epidermidis* and *Bacillus cereus* were 5.9%, 4.7%

and 1.2% respectively, (El-Attar *et al*; 1997) who isolated *Staph. albus* and *Staph. epidermidis* from quail with an incidence of 2.4% and 6.4% respectively.

The experimentally orally route of infection in 3 day old quails showed signs of depression and diarrhea with mortality rate 70% between 1st and 5th day post inoculation, and dead birds developed general congestion as peritonitis, fibrinous pericarditis, airsacculitis and perihepatitis. Similar results were obtained by (Susantha *et al*: 1997) and (Hebat-Allah and Fouad, 2004). As shown in Table (3) the results of antimicrobial sensitivity test for *E. Coli* and *Salmonella* isolates revealed that, the *E.coli* isolates were highly sensitive to enrofloxacin, danofloxacin, flumequin and gentamycin. Similar results were reported by (Hamouda and Amer, 2000) who showed that the *E.coli* strains were sensitive to enrofloxacin and gentamycin. On the other hand, *Salmonella* isolates were highly sensitive to enrofloxacin, danofloxacin, flumequin, gentamycin, lincomycin and chloramphenicol. These agreed with the results obtained by (Stefanov *et al*; 1986) and Mazurkiewicz *et al*; 1990), they concluded the *Salmonella pullorum* and *Salmonella typhimurium* isolates were highly sensitive to gentamycin, enrofloxacin and chloramphenicol.

From this study we concluded that, the bacterial agents causing high mortality among quail farms and without control of these agents in quail farms resulting in decrease feed efficiency, growth rate and poor flock uniformity. This support the importance of sanitation and sound mangement as well as periodically application of sensitivity test against such agents.

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Table 1: Incidence of bacterial isolates from quails.

Species	+/No	%
<i>E.coli</i>	10/85	11.8
<i>S.pullorm</i>	7/85	8.2
Staph.aureus	5/85	5.9
Staph.epidermidis	4/85	4.7
<i>S.typhimurium</i>	2/85	2.4
<i>B.cerius</i>	1/85	1.2

+/No = positive number / examined number

Table 2: Shows the results of pathogenicity test in 3.day old quails

Group. No	No.of infec. quails	Route of infection	Inoculum dose	Daily death post -infection							Total No of death	No of survial	Mortality rate
				1	2	3	4	5	6	7			
1	10	Orally	3×10^8	2	2	1	1	1	0	0	7	3	70
2	10	control	-	-	-	-	-	-	-	-	-	10	-

Table 3: shows the results of antimicrobial discs.

Antimicrobial agents	Sensitivity of <i>E.coli</i> isolates	Sensitivity of <i>Salmonella</i> isolates
Enrofloxacin	+++	+++
Danofloxacin	+++	+++
Tetracyclin	-	-
Colistin sulfate	+	+
Flumequin	+++	+++
Ampicillin	-	-
Gentamycin	-++	+++
Lincomycin	+	+++
Naladixic acid	+	+
Streptomycin	-	-
Chloramphenicol	-	+++

+++ =Highly sensitive

++ =Moderatly sensitive

+ =Weakly sensitive

- = Resistant