

Studies on Some Bacterial Infections In Quails In Bohira Province

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ABSTRACT

A total of 70 quail's samples of variable ages were collected from different private farms in Bohaira province. The birds were suffering from a disease problem bacteriologically investigated and subjected. *E.coli*, *Klebsiella*, *Enterobacter*, *Citrobacter* and *Proteus* species as members of *Enterobacteriaceae* were isolated in an incidence 60.7% , 9.7% , 5.9 % , 9.3 % , and 9.7% respectively. *Pseudomonas. aerogenosa*, *Pseudomonas. fluorescen*, and *Pseudomonas aerofascice* were isolated in an incidence of 68 % , 23.7 and 7.9 respectively . *Staphylococcus aureus* was also isolated with a percent of 50.6 .*Staph. Gallinarum*, *Staph. Epidermidis*, *Staph. Haemolyticus*, *Staph. Intermedius*, *Staph cohini I,II* , *Staph. capitis* and *Staph. hycus* were isolated with an incidences of 8.6% , 8.6% , 6.6% , 6.6% , 4.6% , 5.3% , 4.6% and 3.2% respectively . Enterococci was isolated in incidence of 67.3% classified into *Enterococci faecales* , *Enterococci faciun* and *Enterococci avium* in an incidence of 40.4% , 15.4% and 11.5%, in addition to *Streptococci* in an incidence of 32.6% *Strept . gallinarun* *Strept dysagalactea*, *Strept . bovis* and *Strept pneumoni* were isolated in an incidence of 11.5% , 9.6%, 3.8% and 7.6% respectively. The prevalence of isolation from different sites of isolation were calculated.

INTRODUCTION

Quails becomes widely distributed in Egypt as a source of meat and egg production , since their meat and eggs are highly preferable to consumers for low content of cholesterol (1). Moreover, quail farms occupies less space area per bird and consumed less feed with higher metabolic rate (2) .

E. coli is a normal inhabitant of intestinal tract (3) found with an incidence of 16 % and 52 % in liver and intestine respectively with an average of 36 % sixty percentage (4). recovery rat from intestine. Coli-septicemia induced experimentally by ser-group O165 in Japanese quail resulted in 90% mortalities (5). Several members of *Enterobacteriaceae* could be isolated from birds. *Citrobacter* was isolated from weak chicks and yolk sac infection (6,7). Also *Enterobacter* is normal inhabitant in digestive tract of avian species (8). It induced omphalities , yolk sac infection (7,9). *Klebsiella* have been associated with respiratory, ocular, septicemia and reproductive disease in poultry (6). *Proteus* as genus of family *Enterobacteriaceae* habitat lower intestinal tract and could induce septicemia in quails (10). *Proteus mirabilis* was isolated from lung, trachea, kidneys and intestine (11). *Pseudomonas aeroginosa* is the

predomenant in causing infection, however, *Pseudomonas fluorescens* could be recovered as multi causal respiratory disease in chicken (11) .

Staphylococcus spp. frequently isolated from poultry as *Staph. aureus* and *Staph . epidermidis* , also *Staph . gallinarum* , *Staph. hycus* has been associated with many diseases in poultry (10) *Streptococcus* spp isolated from avian species and associated with disease include *Strept zooepidemicus* (occasionally referred as *Strept. gallinaram*), *Strept. bovis* and *Strept. dysaglactea* . Moreover. *Enterococcus faecales*, *Enterococcus faecium*, *Enterococcus durans* are naturally and experimentally caused poultry infections, reslting in bacterial endocarditis and septecemia (10) *Campylobacteriosis* is contagious disease in poultry characterized by low mortality and high morbidity with chronic course (12). *Campylobacter jejuni* is the main etiologic agent of the disease and has a zoonotic significance in human (13) .

The aim of this study was planned to focus on prevalence of *Enterobacteriaceae*, *Pseudomonas*, *Staphylococci* and *Streptococci* & *Enterococci*, in addition to trials for isolation of *Campylobacter* from Japanese quails .

MATERIAL AND METHODS

A total of 70 Japanese quails were collected from different private farms at different localities of Bohaira province. The collected samples were at different ages (few days old up to breeders) All were clinically diseased. Sample from lung, heart liver, crop, and intestine, were taken and bacteriologically investigated.

Bacteriological examinations

1. Culture methods

Collected samples were inoculated onto nutrient broth, for *Staphylococci*, *Streptococci*, *Pseudomonas*, and on Seleniet F. broth for culture *Enterobacteriaceae*. In addition to thiol broth for culture *Campylobacter*. All were incubated overnight at 37°C then nutrient

broth was cultured on nutrient agar, blood agar, Barid parker agar, Manitol salt agar and K.F. agar for *Staphylococci*, *Streptococci* and *Pseudomonas*, Seleniet -F- broth was cultured on Mackonky agar for *Enterobacteriaceae*. Thiol broth was cultured on to T.C.B.S. agar. All plates except T.C.B.S. were incubated at 37°C for 24 hr. T.C.B.S. were cultured by candle jar at 37°C for 48-72 hrs

2. Identification of bacterial isolates

Bacterial colonies were identified morphologically and biochemically (14- 16)

RESULTS

Results of prevalence and distribution of all bacterial isolates from diseases quails collected from different farms are presented in Tables (1- 4).

Table 1. Prevalence and sit distribution of Enterobacteriaceae in Japanese Quails.

Organism Organ	Lung		Heart		Liver		Crop		Intestine		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
<i>E coli</i>	18	12.5	25	16.4	45	31.3	13	9	45	29.9	144	60.7
<i>Kllaebiel</i>	2	0.8	1	0.4	4	1.6	1	0.4	10	4.2	18	7.6
<i>Kelb. pnumonis</i>	2	22.2	1	11.1	3		—	33.3	3	33.3	9	3.8
<i>Kleb.pnu.-ozaene</i>	—		—		2		1		2		5	2.1
<i>Oxytocia</i>	—		—		1	25	—		3	75	4	1.7
<i>Enterobacter</i>	—		—		4	1.7	3	1.3	7	2.9	14	5.9
<i>Ent. arogens</i>	—		—		3	30	3	30	4	40	10	4.2
<i>Ent. Cloaca</i>	—		—		1	25	—		3	75	4	1.7
<i>Citrobacter</i>	3	1.3	2	0.8	7	2.9	—		10	4.2	22	9.3
<i>Cit. frundii</i>	3	18.8	1	6.3	5	13.3	—		7	43.7	16	6.8
<i>Cit diverus</i>	—		1	16.6	2	33.3	—		3	50.0	6	2.5
<i>Proteus</i>	2	0.8	2	0.8	5	2.1	5	2.1	7	3.1	23	9.7
<i>Prot. vulgaris</i>	—		—		2	25	2	25	4	50	8	3.4
<i>Prot. merabillis</i>	2	15.4	2	15.4	3	23	3	23	3	23	13	5.5
TOTAL	25	10.5	30	12.6	65	27.4	22	10.1	79	33.3	237	100

N = Number of positive samples -- = Negative

% = Number of positive per total number of positive samples from different organs

Table 3 .Prevalence and sit distribution of *Pseudomonas* spp in Japanese Quails.

Isolate	Lung		Heart		Liver		Crop		Intestine		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
<i>Pseud. aerogenosa</i>	4	15.4	4	15.4	4	15.4	5	19.2	9	34.6	26	68.4
<i>Pseud. florec III</i>	1	25	1	25	1	25			1	25	4	10.5
<i>Pseud. florec IV</i>			1	20			1	20	2	40	4	10.5
<i>Pseud. aerofassiencel</i>							1	33	2	66	3	7.9
Total	5	13.2	6	15.8	5	13.2	7	18.4	14	36.8	37	100

N = Number of positive samples --- = Negative

% = Number of positive per total number of positive samples from different organs

Table 4. Prevalence and sit distribution of Staph. Cocci in Japanese Quails.

Isolate	Lung		Heart		Liver		Crop		Intesting		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
<i>Staph. aureus</i>	22	28.6	16	20.8	18	23.4	7	9.1	14	18.2	77	50.6
<i>Staph. gallinarun</i>	5	38.5	2	15.4	2	15.4	1	7.7	3	23.1	13	8.6
<i>Staph. epedermidis</i>	2	15.4	3	23.1	3	23.1	4	30.8	1	7.7	15	8.6
<i>Staph. heamolytius</i>	2	20	2	20	3	30	2	20	1	10	10	6.6
<i>Staph. intermedius</i>	2	20	3	30	3	30	1	10	1	10	10	6.6
<i>Staph. cohini I</i>	1	14.3	2	28.6	2	28.6	1	14.3	1	14.3	7	4.6
<i>Staph. cohini II</i>	1	12.5	3	37.5	2	25	1	12.5	1	12.5	8	5.3
<i>Staph. capitis</i>	1	14.3	2	28.6	2	28.6	1	14.3	1	14.3	7	4.6
<i>Staph. cornosus</i>	—		—		—		1	50	1	50	2	1.3
<i>Staph. hycus</i>	—		1	20	2	40	1	20	1	20	5	3.2
Total	36	23.7	34	22.4	37	24.3	20	13.1	25	16.4	152	100%

N = Number of positive samples -- = Negative

% = Number of positive per total number of positive samples from different organs

Table 5. Prevalence and sit distribution of Enterococci isolated from Japanese Quails .

Isolate	Lung		Heart		Liver		Crop		Intestine		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
<i>Enterococci</i>	4	7.7	3	5.8	9	17.3	6	11.5	13	25	21	40.4
<i>Ent. foecales</i>	3	14.3	2	9.5	4	19	3	13.3	9	42.9	21	40.4
<i>Ent. facian</i>	—		—		4	50	2	25	2	25	8	15.4
<i>Ent. avium</i>	1	16.6	1	16.6	1	16.6	1	16.6	2	33.3	6	11.5
<i>Streptococci</i>	4	7.7	2	3.8	6	11.5	3	5.8	2	3.8	17	
<i>Strept. gallinaram</i>	1	16.6	1	16.6	2	33.3	1	16.6	1	16.6	6	11.5
<i>Strept. dysagalactea</i>					2	40	2	40	1	20	5	9.6
<i>Strept. bovis</i>	1	50			1	50					2	3.8
<i>Strept. pneumoni</i>	2	50	1	25	1	25					4	7.6
Total	8	15.4	5	9.6	15	28.8	9	17.3	15	28.8	52	100%

N = Number of positive samples -- = Negative

% = Number of positive per total number of positive samples from different organs

DISCUSSION

Quail farms have gained popularity during the last decade and the best known breed in Egypt is Japanese quail which breeds for egg and meat production due to low cholesterol content and valuable protein source (1).

The contact of quail farms & broiler farms facilitate the possibility of pathogens transmission regardless the species occurred. This work was planned to focus some light on microbial state of 70 diseased Japanese quails of variable ages collected from different farms. The prevalence of *Enterobacteriaceae* as shown in Table 1 indicated that, *E. coli* was the predominant isolate forming 60.7% among the *Enterobacteriaceae*. The site distribution of *E. coli* was the lung, heart, liver, crop and intestine which revealed 12.5%, 16.4%, 31.3%, 9% and 29.9% respectively, *E. coli* was recovered from liver and intestine as 16% and 52% respectively with total percent 34, (3,4,17). Also, infection rate was 34% of examined liver and a higher rate (18) was recovered (19). Who found an incidence 55.3% of *E. coli* among diseased or dying quails. The variation of isolation rate among different organs revealed that, the lowest rate was in crops which denote the oral contamination via water and ration and scanty growth rates, followed by respiratory origin. *E. coli* gains access to circulation following damage to the respiratory mucosa by infectious or noninfectious agents (10,20). Heart and liver isolation rates are higher where isolation in colisepticemia increased. The intestine has high incidence because this is the normal habitat of the organism.

Klebsiella is an environmental contaminant that occasionally cause mortality in young birds in addition respiratory signs ocular lesions and

septicemia, *Klebsiella pneumoniae* had the highest mortalities (21).

In the present study *Klebsiella* was isolated from lung, heart liver, crop and intestine (Table 1). The overall incidence of *Klebsiella* species reached 7.4 % *Klebsiella pneumoniae*, *Klebsiella pneumoniae* sub spp. *ozaena* and *Klebsiella oxytoca* were in incidences of 3.8 %, 2.1 % and 1.7% respectively.

Enterobacter is normal inhabitant of the avian digestive tract (8) in common with other *Enterobacteriaceae* and could infect eggs and young chick causing mortalities (7). In the present study *Enterobacter aerogenes* and *Enterobacter cloacae* were isolated with incidence of 4.2% and 1.7% respectively. The total incidence of *Enterobacter* spp. was 5.9% they were recovered from liver, intestine and crop, the higher rate of recovery was from intestine as the normal habitat of the organism.

Citrobacter is a member of *Enterobacteriaceae* commonly colonized mucous membrane of respiratory and digestive tract in normal bird but could be an opportunistic pathogen and could be isolated from weak chick and yolk-sac infection (6,7). *Citrobacter freundii* and *Citrobacter diversus* could be isolated in an incidence of 6.8 % and 2.5% respectively (Table 1) *Citrobacter freundii* was isolated from intestine, liver, lung and heart, in a percent of 43.7, 31.3, 18.8 and 6.3 respectively. *Citrobacter* forms 9.3% of *Enterobacteriaceae* isolates similar results were previously recorded (6,7).

Proteus spp Isolation as shown in Table 1 were 3.4% and 5.5% for *Proteus vulgaris* and *Proteus mirabilis*. They were *Proteus* spp isolated from 8-90% of dead young quails and Japanese quails (3,22). This variation could be attributed to that, the isolation was carried out on

died young quails. On the other hand *Proteus merabillis* was isolated from lung trachea and parenchymatus organs (23). This finding agreed with the present study where *Proteus merabillis* were isolated from lung, heart liver, crop and intestine in an incidence of 15.4%, 15.4%, 23% and 23% respectively from total *Proteus* isolates.

Pseudomonas infections in birds are of great importance for its rapid spread, mortalities in all ages and difficulty in treatments. In the current study *Pseudomonas aerogenosa*, *Pseudomonas florescence biovar III* *Pseudomonis florescence biovar IV* and *Pseudomonas aerofascience* were isolated in distribution of 68.4 %, 10.5%, 13.2% and 7.2% respectively. These results agreed with literatures which emphasized those *Pseudomonas aerogenosa* is the predominant species causing infection among quails (24). *Pseudomonas aerogenosa* could be isolated from intestinal content, cloacal swab, nasal swab, lung, liver and yolk sac in diseased. This study coincided with the previous records (25,26) which showed that *Pseudomonas aerogenosa* could be isolated from lung, heart, liver, intestine in an incidence of 15.4%, 15.4%, 15.4% and 34.6% respectively as distribution of the positive isolates. This study revealed isolates of *Pseudomonas florescence* in lower incidences as 10.5% from gained isolates *Pseudomonas florescence* has been associated with multicosal respiratory diseases of chick and turkey (11).

Genus *Staphylococcus* contains 32 species are associated with a wide variety of diseases in chicken and other avian species. They include septicemia, arthritis, yolk sac infection and many disease conditions (27). In the present Study as in Table 3 *Staphylococci* members were isolated in incidences of 50.6 %, 8.6 %, 8.6 %, 6.6 %, 4.6 %, 5.3 %, 4.6 %, 1.3 % and 3.2 % for both of *Staph. aureus*, *Staph. gallenarum*, *Staph. epedermidis*, *Staph. haemolyticus*, *Staph. entermedius*, *Staph. choini I&II*, *Staph. capitis*, *Staph. cornosus* and *Staph. hycus* respectively. *Staph. aureus* was most prevalent strain with an incidence of 27% followed by *Staph epedermides* (11.76%) (28). Higher incidences

of isolated *Staph.aureus* were recorded (27) as 62%. On the other hand, lower incidences were recorded (3) and an incidence of 6% in each of liver and intestine of Japanese quails was recorded. *Staph. aureus*, *Staph. epedermidis*, *Staph. gallenarum* and *Staph. hycus* are frequently isolated from poultry which agreed with the present study.

Concerning *Enterococci*, the prevalence and site distribution are illustrated in Table 4 *Ent. foecales*, *Ent. facium*, *Ent. avian*. *Strept. gallinarum*, *Strept. dysagalacted*, *Strept. bovis* and *Strept. pneumoni* were isolated from quail in distribution of 40.4 % 15.4% , 11.5 % , 11.5% , 9.6% , 3.8 and 7,6 respectively. *Streptococci* was isolated from avian species and associated with disease conditions include *Strept. zooepedemicus* occasionally reformed as *Strept. gallinarum*), *Strept. bovis* and *Strept. dysagalactea*, moreover, (10,29). Experimentally and naturally infection of *Strept. bovis* causing acute septicemia in racing pigeons. Moreover bacterial endocarditis is commonly associated with *Strept. gallinarum* , *Ent. Faecales* and *Entero. faeuim* (30) .

Ent. fecales was the predominant isolate among *Enterococci* and *Streptococci* where it could be detected in 40.4% Table 4. Other *Enterococcus* species isolated from avian species and associated with disease were *Ent. fecales* , *Ent . facium* *Ent. avium* (31). These results agreed with those recovered in the present study Table 4.

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الملخص العربي

دراسة عن بعض الإصابات البكتيرية في السمان بمحافظة البحيرة

أحمد أبو المجد بخيت

معهد صحة الحيوان – محافظة البحيرة - دمنهور

أجريت هذه الدراسة على عدد ٧٠ سبعون عينة مختلفة الأعمار من مزارع خاصة بمحافظة البحيرة وكانت كل عينة ممثلة لمشكلة مرضية تم إجراء الدراسة البكتريولوجية لهذه العينات على الأنسجة المختلفة التي شملت الرئة والقلب والكبد والحوصلة والأمعاء وقد تم عزل الايشريشيا كولاي القولونية والكلبيسيلا والأنتيروبكتري والستروباكتري والعصيات الزائفة ممثلة لعائلة البكتريا المعوية وكانت نسبة تواجدها على التوالي ٦٠,٧% و ٩,٧% و ٥,٩% و ٩,٣% و ٩,٧% تم عزل ميكروب السودوموناس ايروجينوسا وسودوموناس فلورسنسي وسودوموناس ايروفيشنسي بنسب ٦٨% و ٢٣,٧% و ٧,٠٩% على التوالي

تم عزل الميكروب العنقودي الذهبي بنسبة ٥٠,٦% من سلالات الميكروب العنقودي المعزولة إضافة إلى العديد من باقى المجموعة وشملت العنقودي الداجنى والمتوسط والكوهينى ٢,١% والعنقودي الرأس إضافة إلى العنقودي مجموعة هيكل بنسب ٨,٦% و ٨,٦% و ٦,٦% و ٦,٦% و ٤,٦% و ٥,٣% و ٤,٦% على التوالي تم عزل الميكروب السبحى بشقيه البرازى متمثلاً فى المكورات المعوية البرازية والمكورات نوع فيكم و الداجنى بنسب ٤٠,٤% و ١٥,٤% و ١٥,٥% من إجمالى السبقيات المعزولة المقدرة ٥٢ عترة هذا إضافة إلى المكورات السبحية نوع جالينيرم ونوع ديبس أجلاكتيا و المكورات السبحية البقرية والمكورات السبحية الرؤية ١١,٥% و ٩,٦% و ٣,٨% و ٧,٦% هذا ولم يتم عزل أى من الواوات المعوية المؤثرة .