

Detection of the main bacterial causative agents associated with pneumonia cases of pigeons in Al-Diwaniya province

M.A. Khudair

Coll. of Vet. Med. /Unive. Al-Qadissyia

Abstract

In this study, infected lung samples of pigeons at Al-Diwaniya province were tested for the presence of some aerobic bacteria. The identification of bacteria were proved by swabs culturing and biochemical tests. A total of 100 pigeons were examined at post-mortem, and 100 samples with pneumonia were collected. All lungs were collected from different local pigeon's market showing respiratory disorders. Blood agar supplemented with 7% sheep blood was used for isolation of the agents. Two methods were used for culturing the samples collecting from lung which include direct and indirect methods. In both methods bacterial colonies were identified on blood agar and MacConkey agar after that differential media was used for bacterial purification; various biochemical tests were used to study the properties of each bacterium. The aim of this work was to isolate and identify the aerobic bacteria associated with cases showing typical signs of respiratory infections. Bacteriological result showed (107) bacterial isolates which include *Escherchia coli* represent high percentage (29.9%) and *Staphylococcus spp.*(14.%) were considered the most predominant bacteria in comparison to other isolated bacteria which include *Streptococcus pneumonia*, *K. pneumonia*, *E. aerogenense* and *P. vulgaris*. This study showed that *E. coli* is the most prevalent bacterial infection among pigeon population in Al-Diwaniya province.

Introduction

Avian respiratory diseases represent serious economic losses in most poultry producing areas of the world. The etiology of avian respiratory diseases caused mainly by bacteria, mycoplasma and viruses, is highly complex. ⁽¹⁾*Pasteurella multocida* has been consistently found in the upper respiratory tract, spleen, lungs, blood and liver of infected birds ^(2,3). *E. coli* associated

with respiratory infection in chickens has also been reported ⁽⁴⁾. Tracheitis, exudative pneumonia, pleuritis, air sacculitis, pericarditis, sinusitis characterize the infection ⁽⁵⁾. This study was aimed at isolation of aerobic bacterial agents associated with pneumonia in pigeons at Al-Diwaniya province.

Materials and methods

Material. A total of 100 pigeons were examined for presence of pneumonia in lungs at Al-Diwaniya province, and 100 samples were collected. The samples were obtained from different market. Samples were immediately transferred to the laboratory in sterile plastic containers, where they were processed.

Culture. Swabs from the lung samples were inoculated onto blood agar supplemented with 7% sheep blood. The plates were incubated under aerobic conditions for 24-48 h at 37 °C. The agar plates were checked every day for suspected colonies.

Identification bacterial species was assessed by observation of the colonial morphology and Gram staining results and by biochemical methods. Methods were as follows: catalase, nitrate reduction, H₂S production in triple sugar iron (TSI), growth on MacConkey agar, Eosin Methylene Blue Agar, indol production, urease activity, methyle red production, Voges Proskauer test reaction, oxidase reaction, coagulase, motility, citrate, carbohydrate fermentation from glucose, sucrose, lactose, ⁽⁶⁾. Each isolate was frozen at -4 °C in a nutrient agar with 20% of glycerol for further analysis.

Results

The results showed that 84(84%) and 26(26%) samples were negative. (Table 1) samples were positive to bacterial growth

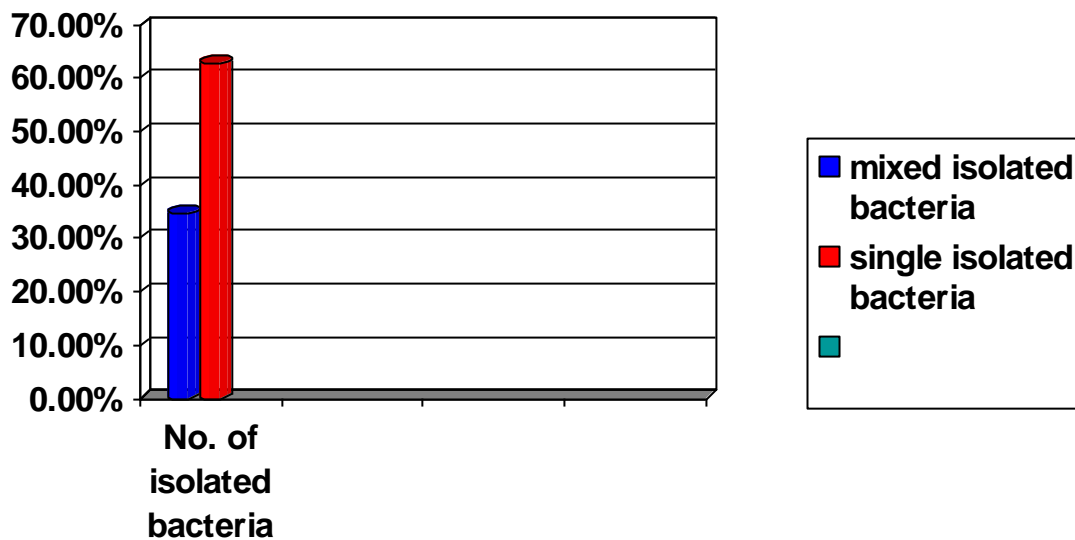
Table 1: numbers and percentages of infected lung samples

Growth results	Infected lung	
	No.	(%)
Positive	84	84%
Negative	26	26%
Total	100	100%

Isolation and identification of bacteria:

One hundred samples have given 107 bacterial isolates, which were divided to 37 (34.6%) isolates represented seventeen

samples as mixed isolates, and 67(62.6%) isolates, were single Gram-positive bacteria and Gram- negative bacteria. (Fig 1).



Fig(1): showed percentages of both mixed and single isolated bacteria

The higher percentage of isolation to *Escherichia coli* 32(29.9%) and less to *Streptococcus pneumonia* and *Enterobacter aerogenos* have the same percentage 10 (9.3%). (Table 2)

Table 2: Isolated bacteria and isolation rates

Isolated bacteria	No. of isolates	The percentages (%)
<i>Escherichia coli</i>	32	29.9
<i>klebseila pneumonia</i>	11	10.3
<i>Staphylococcus aureus</i>	15	14
<i>Streptococcus pneumonia</i>	10	9.3
<i>E. coli</i> + <i>Proteus vulgaris</i>	18	16.8
<i>Staphylococcus aureus</i> + <i>Proteus vulgaris</i>	11	10.3
<i>Staphylococcus aureus.</i> + <i>Enterobacter aerogenese</i>	10	9.3
Total	107	99.9

Discussion

Respiratory infections are common among the chicken population. Several micro-organisms are collaborated in respiratory diseases of domestic poultry ⁽⁷⁾. Isolation percentages obtained in this study were rather high (84%) compared to the total number of pigeon examined. This may be due to the fact that most of our samples were taken from aggregation in the acute phase of the infection and also due to pigeon owner in Al-Diwaniya province not used antibiotics. In addition to *E. coli*, other pathogenic bacteria isolated and identified from lungs samples of pigeons This study showed that *E. coli* is the most prevalent bacterial infection among pigeons population in Al-Diwaniya province.

Intensive studies are needed to comprehend the epidemiology of disorders of the respiratory tract in the poultry within this region. The isolation of *Streptococcus* spp., and *Staphylococcus* spp., from the trachea and the sinus of diseased birds was previously reported by Linizitto *et al.* (1988). The isolation of *E. coli* and *Proteus* spp. was in agreement with the findings of McMartin (1962), Khogali (1970) and Linizitto *et al.* (1988). Signs of illness and lesions were always severe in cases of *E. coli* involvement. This organism causes pneumonia and panophthalmitis in poultry as a primary aetiology. Similar results were also reported by Seetha (1988).

References

- Toth, T. E. (2000): Nonspecific cellular defense of the avian respiratory system: a review. *Dev. Comp. Immunol.* 24, 121-139.
- Rhoades, K. R. (1964): Microscopic lesions of acute fowl cholera in mature chickens. *Avian Dis.* 8, 658-665.
- Hunter, B. and Wobeser, G. (1980). Pathology of experinmental avian cholera in mallard ducks. *Avian Dis.*, 24: 403-414.
- El-Sukhon, S.N., Musa, A., Al-Attar, M. (2002). Studies on the bacterial etiology of air sacculitis of broilers in Northern and Middle Jordan with special reference to *Escherichia coli*, *Ornithobacterium rhinotracheale* and *Bordetella avium*. *Avian Dis.*, 46: 605-612
- Canal, C.W., Leao, J. A., Rochas, S. L. S., Macagnav, M., Lima-Rosa, C.A.V. Oliveira, S.D. and Back, A. (2005). Isolation and characterization of

- Ornithobacterium rhinotraechiale* from chickens in Brazil. Res. Vet. Sci., 78: 225-230.
6. Carter, G.R., (1984). *Pasteurella*. Bergeys manual of systematic bacteriology. William and ilkins. In: Krieg, N.R. and J.G. Holt (Eds.). Baltimore, 1: 552- 558.
7. Ozbey, G. and Muz, A., (2006). Isolation of aerobic bacteria from lungs of chickens showing respiratory disorders and confirmation of *P. multocida* by polymerase chain reaction (PCR). Vet. Archive, 76: 217-225.
8. Linizitto, O. R., Aberio, H.D., Benitez, R. and Mendez, N.A. (1988). *Rev. Med. Vet. Buenos Aires.*, 69: 96-101.
9. McMartin, M.(1962). *Poultry Rev.*: 43-51.
10. Khogali, A.R. (1970). Respiratory Diseases of the fowl in the Sudan. M.V.Sc. Thesis. University of Khartoum.
11. Seetha, R. R (1988). *Poultry Adviser.* 221:49-54.

الكشف عن المسببات الجرثومية الرئيسية المسببة لذات الرئة في الحمام في محافظة الديوانية

محاسن عبد الرزاق خضير
كلية الطب البيطري/ جامعة القادسية

الخلاصة

في هذه الدراسة، فحصت عينات الرئة المصابة من الحمام في محافظة الديوانية للكشف عن وجود الجراثيم الهوائية فيها. تم تشخيص الجراثيم بواسطة زرع المسحات و الاختبارات البايوكيميائية. أخذت 100 حمامة و فحصت بعد الموت، ثم جمعت 100 عينة. جمعت هذه العينات من تجمعات مختلفة من الحمام التي تعاني من الإصابات التنفسية. تم استخدام أكار الدم الذي يحتوي على 7% من دم الأغنام لغرض العزل الجرثومي. تم استخدام طريقتين لزراعة العينات المجموعة من الرئة و التي تتضمن الطريقة المباشرة و الغير مباشرة. في كلا الطريقتين، تم تشخيص المستعمرات الجرثومية على أكار الدم و أكار الماكونكي ثم استخدمت الأوساط الزرعية التفرقية لكل نوع من الجراثيم و ذلك لغرض تفتيتها، بعد ذلك استخدم الاختبارات البايوكيميائية لغرض دراسة خصائص الجراثيم. إن هدف هذه الدراسة هو تسليط الضوء على أهم المسببات الجرثومية الهوائية المتعلقة بالحالات التي تظهر العلامات النموذجية للإصابات التنفسية. أظهرت النتائج البكتريولوجية عزل (107) عزلة جرثومية و التي تتضمن الإشريشا القولونية و التي مثلت النسبة الاعلى (29.9%) ثم المكورات العنقودية الهيبية (14%) ثم الكلبسيلا الرئوية و المتقلبات الاعتيادية و المكورات السبحية الرئوية و اخيرا الأنثروبكتريا ايروجينوزا. أظهرت هذه الدراسة بان الإشريشيا القولونية هي البكتريا الأكثر شيوعا في تسبب الالتهابات التنفسية في الحمام في محافظة الديوانية.