قسم : الميكروبيولوجيا
كلية الطب البيطرى ـ جامعة القاهرة
رئيس القسم : ا.د / أحمد فريد حسن

باستيريلا ملتوسيدا فى الطيور

١ ـ أسقبيان عن الباستيريلا فى الدجاج والرومى

أحمد فريد ، حلمى تركى *، محب النمر *، محمد عقيلة *، محمود عزت *

تم تجميع عدد ١٣٢٥ مسحة من الفتحة الأنفية والتجويف الأنفى البلعومى والقصبة الهوائية للدجاج وكذا فراخ الرومى سليمة ظاهريا ومتكررة الأصابة بالباستيريلا وكانت نسبة العزل فى كل من الدجاج والرموى معا ١١ر٣ ٪ (١٥٠ عترة) وأظهرت النتائج أن عزل ميكروب الباستيريلا من الرومى أقل بكثير عن مثيلاتها من الدجاج (٨ر٩ ٪ ، ١١ر٨ ٪ على التوالى) .

كما وجد أن نسبة عزل ميكروب الباستيريلا من الحالات المتكررة الأصابة عالية بالمقارنة بعدد العترات المعزولة من الطيور السليمة ظاهريا (١٤٧ ، ٧ عترات على التوالى) . وكانت نسبة عزل الميكروب من التجويف الأنفى البلعومى والفتحة الأنفية والقصبة الهوائية كالآتى ٣ر٢٥ ٪ و ١٢ ٪ و ١ر٤ ٪ على التوالى .

---

* كلية الطب البيطرى بأدفينا ـ جامعة الأسكندرية

Dept. of Microbiology,
Faculty of Vet.Med., Cairo University,
Head of Dept. Prof. Dr. A. Farid.

STUDIES ON PASTEURELLA MULTOCIDA OF BIRDS
1- INCIDENCE IN CHICKENS AND TURKEYS

(With 4 Tables & 1 Fig.)

By
A.H. FARID; H.A. TORKY*; M.M. EL-NIMR*; M.A. AKEULA* and M. EZZAT*

(Received at 20/10/1985)

SUMMARY

A total of 1325 swabs were collected from the nasal cleft, nosopharynx and trachea of infected as well as apparently healthy fowls and turkeys of not less than 3 months old.

The incidence of total recovery rate was found to be 11.3% (150 swabs).

The incidence of isolation of P. multocida was significanlty lower in turkeys than that from fowls (11.8 versus 8.9%).

The number of positive cases from reported infected birds was higher, in contrary to the lower percentage from healthy birds (143 and 7 strains respectively).

The rate of isolation from the swabs was 25.3, 12 and 1.4 for the nasopharyngeal, nasal and tracheal swabs respectively.

INTRODUCTION

P. multocida causes acute or chronic fowl cholera in domestic birds. The disease is of economic importance in poultry farms. Economic losses due to P. multocida were reported in most countries of the world. Under field conditions, losses due to fowl cholera sometimes occurred even in vaccinated flocks. In additin, the organism may be isolated from the blood and other parts of the body from carrier birds for much longer periods (HENDRICKSON and HILBERT, 1932; PRITCHETT and HUGHES, 1932; HALL, et al. 1955 and HOFSTAND, 1972). Usually, the nasal cleft (PRITCHETT and HUGHES, 1932), and nasal secretions (ILIEV, et al. 1963) are the place where the organism resides in carrier birds. Hence there is a danger of contaminating the surrounding, since the organism remains dormant, but under stress factors, it become virulent and infection occurs (KRECOV, 1976).

In Egypt, great consideration has been given to this disease during the past few years. Thus the purpose of the present work, is to study the prevalence of the incidence of P. multocida among carriers and apparently healthy fowl cholera in chickens and turkeys at Kafr El-Shiekh and Gharbia Governorates. This was conducted by examining nasal cleft, nasopharyngeal and tracheal swabs from such birds.

* Faculty of Vet. Med., Edfina, Alexandria Univ.

MATERIAL and METHODS

1) Samples:

A total of 1325 swabs (Nasal Cleft, tracheal and nasopharyngeal swabs) were collected from alive chickens and turkeys of different ages and sexes of local and foreign breeds of different flocks from Behera, Kafr El-Shiekh and Gharbia Governorates. Some of these were from farms with no history of avian pasteurellosis as well as from farms where the disease had been previously diagnosed with the isolation of P. multocida.

2) Isolation and cultivation of the causative agents:

For the isolation of P. multocida, the swabs were transferred as quickly as possible into a nutrient broth then incubated at 37°C for 4-6 hours. Following this, 0.1 ml. from the incubated broth suspension were subcutaneously (S/C) injected into white mice for the isolation. The mice were left under observation for about one week. Those dying after inoculation (Within 18 hours to 3 days) were subjected to P.M. examination. Blood films were prepared from heart, liver and spleen and stained with either Leishman's or Giemsa stain for the detection of the specific bipolarity. At the same time, for the isolation of the organism in pure form, heart blood samples were aspirated, inoculated into nutrient broth, incubated for 18 hours at 37°C, streaked on 5% sheep blood agar plates then incubated for 18-24 hours to avoid over growth of the contaminants. In case of pure isolation of Pasteurella, suspected colonies were furtherly identified for its morphological, colonial and biochemical characters.

3) Stains:

The following stains were used for staining either blood films or culture films for demonstration and differentiation of the morphology of the suspected isolates:

a) Gram's stain (CRUICKSHANK, et al. 1975).
b) Loffler's methylene blue stain (CRUICKSHANK, et al. 1975).
c) Dilute carbol Fuchsin stain (1:15).
d) Leishman's stain (CRUICKSHANK, et al. 1975).
e) Giemsa stain (CRUICKSHANK, et al. 1975).

4) Laboratory animals:

Adult mice of 7-9 weeks old were used for both isolation and to study the pathogenicity test of the isolated strains. These mice were supplied by the laboratory Animal Unit at the Veterinary Serum and Vaccine Production Institute, Abbassia, Ministry of Agriculture.

RESULTS

1) Samples:

Table (1) summarizes the type and number of swabs collected from both fowls and turkeys.

2) Incidence of P. multocida:

Results of this investigation are presented in tables (2&3) which shows the incidence of positive cases as detected by isolation of the organism, death of injected mice and presence

of typical bipolarity in examined smears. In addition, one finds the incidence of isolates from the different examined swabs.

Table (1)
Distribution of various samples collected from reported infected and apparently healthy fowls and turkeys

Type of samples	Fowls		Turkeys	
	Reported infected	Apparently healthy	Reported infected	Apparently healthy
Nasal Cleft.	600	40	86	13
Tracheal.	250	35	63	17
Nasopharynx.	150	25	35	11
Total number	1000	100	184	41

Table (2)
Incidence of positive cases from collected samples

Species of birds	Total Number of examined samples	Positive cases		Negative cases	
		No.	%	No.	%
Fowls.	1100	130	11.8	970	88.18
Turkeys.	225	20	8.9	205	91.10
Total number	1325	150	11.32	1175	88.68

Table (3)
Rate of isolation of P. multocida from different examined swabs

	No. of samples	No. of positive cases	No. of negative cases	Isolation rate (%)
Nasal cleft.	739	89	650	12.04
Nasopharynx.	221	56	165	25.34
Tracheal.	365	5	360	1.37
Total number	1325	150	1175	11.32

3) Distribution of positive cases in healthy and reported infected birds:

Results of this study are found in table (4) and Fig. (1). This shows that the incidence of P. multocida in turkeys was significantly lower than that in fowls. At the sametime, the incidence in reported infected birds was higher than that from healthy birds.

Table (4)

Distribution of positive cases from reported infected as well as healthy fowls and turkeys

Sample	Fowls						Turkeys					
	Reported infected			Healthy birds			Reported infected			Healthy birds		
	Total	No. of +ve	Rate (%)	Total	No. of +ve	Rate (%)	Total	No. of +ve	Rate (%)	Total	No. of +ve	Rate (%)
Nasal cleft swabs	600	72	12	40	3	7.5	86	13	15.1	13	1	7.7
Nasopharyngeal swabs	150	48	32	25	2	8.0	35	5	14.3	11	1	9.1
Tracheal swabs	250	5	2	35	0	0.0	63	0	0.0	17	0	0.0
Total	1000	125	12.5	100	5	5.0	184	18	9.8	41	2	4.9

DISCUSSION

Since infection of poultry and other animals with P. multocida may be endogenous in nature (BIBERSTEIN, et al. 1960 and HARRY, 1962), thus it has been imperative to investigate the incidence of P. multocida in both repeatedly infected and apparently healthy chickens and turkeys.

Out of a total of 1325 swabs, 150 swabs were positive for P. multocida with an incidence of 11.3%. From these positive samples, 89 were from the nasal cleft swabs, 56 from the nasopharyngeal swabs and 5 from the tracheal swabs with an incidence of 12, 25.3 and 1.4% respectively. These results agreed with those found by PRITCHETT, et al. (1980 a,b) as well as PRITCHETT and HUGHES (1932) who found many birds harbouring the organism in their nasal clefts. Furthermore, NOBREGA and REIS (1937) demonstrated that the fluorescent variant of P. septica could survive for 15 months in the nasal passages of fowls. Moreover, NOBREGA and BUENO (1944) could isolate P. septica from the oral mucous of hens, while the agglutination test failed to detect these carrier hens. HALL, et al. (1955) found that although the mortality rate in the chronic form of fowl cholera was low, yet the infection persisted for four years.

Recently, MUSHIN, et al. (1980) found the incidence of P. haemolytica in the respiratory tract of healthy chickens to be 97% versus a very low incidence in healthy turkeys (3%) CURTIS and OLLERHEAD (1981) by studieng the carrier state of P. multocida in healthy chickens and turkeys, could not isolate the organism from normal healthy flocks but from some alive chickens in infected flocks and from dead turkeys in an infected farm.

Concerning the rate of isolation of P. multocida from reported infected as well as apparently healthy fowls and turkeys, the results demonstrated that in reported infected fowls a rate of 12,32 and 2% was obtained for the nasal cleft, nasopharyngeal and tracheal swabs respectively. On the other hand, in healthy cases,the rates were 7.5, 8 and 0% for the nasal cleft, nosapharyngeal and tracheal swabs. With respect to turkeys, the respective rates in carrier cases were 13, 5 and 0% verus, 1, 1 and 0% in healthy cases for the nasal cleft, nosopharyngeal and tracheal swabs respectively.

These findings demonstrate that the rate of isolation from nasopharynx was the highest, followed by the nasal cleft and finally the trachea which is in agreement with AOUAD (1978). In additin, the rates of isolation from chicken were higher than in turkeys which was as those reported by MUSHIN (1979).

REFERENCES

Aouad, J.I. (1978): Studies on the somatic antigen of Pasteurella multocida in carrier and chronic fowl cholera in Poultry. M.V.Sc. (Microbiology) Thesis, Fac. of Vet. Med., Cairo University.

Biberstein, E.L.; Gills, M. and Knight, H. (1960): Serological types of Pasteurella haemolytica. Cornell Vet. 50: 288-300.

Cruickshank, R.; Duguid, J.P.; Mamion, B.P. and Swain, R.H.A. (1975): Medical Microb., Vol. 11, 12th Ed. Churchill, Livingstone, London.

Curtis, P. and Ollerhead, G. (1981): Investigation to determine whether healthy chickens and turkeys are oral carriers of P. multocida. Vet. Rec., 108 (10): 206-207.

Hall, W.; Heddleston, K.; Legenhausen, D. and Hughes, R. (1955): Studies on Pasteurellosis. 1. Anew species of Pasteurella encountered in chronic fowl cholera. Am. J. Vet. Res., 16: 598-604.

Harry, E.G. (1962): A haemolytic cocco-bacillus recorded from poultry. Vet. Rec., 74: 640.

Hendrickson, J.M. and Hilbert, K.F. (1932): A new and serious septicemic disease of young ducks with a description of the causative organism. Pfeifferella antipestifer, N.S. Cornell Vet., 22 (3): 239-252.

Hofstand, M.S. (1972): Diseases of Poultry. 6th Ed. The Iowa University Press, Ames, 291-241.

Iliev, T.; Arsov, R.; Girginov, G. and Iovtchecv, E. (1963): Prolonged excretion of Pasteurella by fowls. Nauch. Trud. Vissh. Vet. Med. Inst. Sofia, 11: 271-279.

Krecov, M. (1976): Examination of the role of the route of infection and non specific factors in the appearance of fowl cholera. (Summary of thesis). Acta Veternaria, Yugoslavia, 26 (1): 33-45.

Mushin, R. (1979): Serotyping of Pasteurella multocida isolants from poultry. Avian Dis. 23 (3): 608-615.

Mushin, R.; Welsman, Y. and Singer, N. (1980): Pasteurella haemolytica found in the respiratory tract of fowls. Avian Dis. 24 (1): 162-168.

Nobrega, R. and Reis, H. (1937): Fowl cholera carriers Arq. Inst. Biol. (S. Paula), 8: 183-188.

Nobrega, R. and Bueno, R. (1944): Detection of fowl cholera carriers. Arg. Inst. Biol. (S. Paulo), 15: 339-342.

Pritchett, I.W.; Beaudette, F.R. and Hughes, T.P. (1930 a): The epidemiology of fowl cholera. IV. Field observations of the spontaneous disease. J. Exp. Med., 51: 249-258.

Pritchett, I.W.; Beaudette, F.R. and Hughes, T.P. (1930 b): The epidemiology fo fowl cholera. V Further field observation of the spontaneous disease. J. Exp. Med. 51: 259-274.

Pritchett, I.W. and Hughes, T.P. (1932): The epidemiology of fowl cholera, VI. The spread of epidemic and endemic strains of Pasteurella avicida in laboratory population of normal fowls. J. Exp. Med., 53: 71-78.

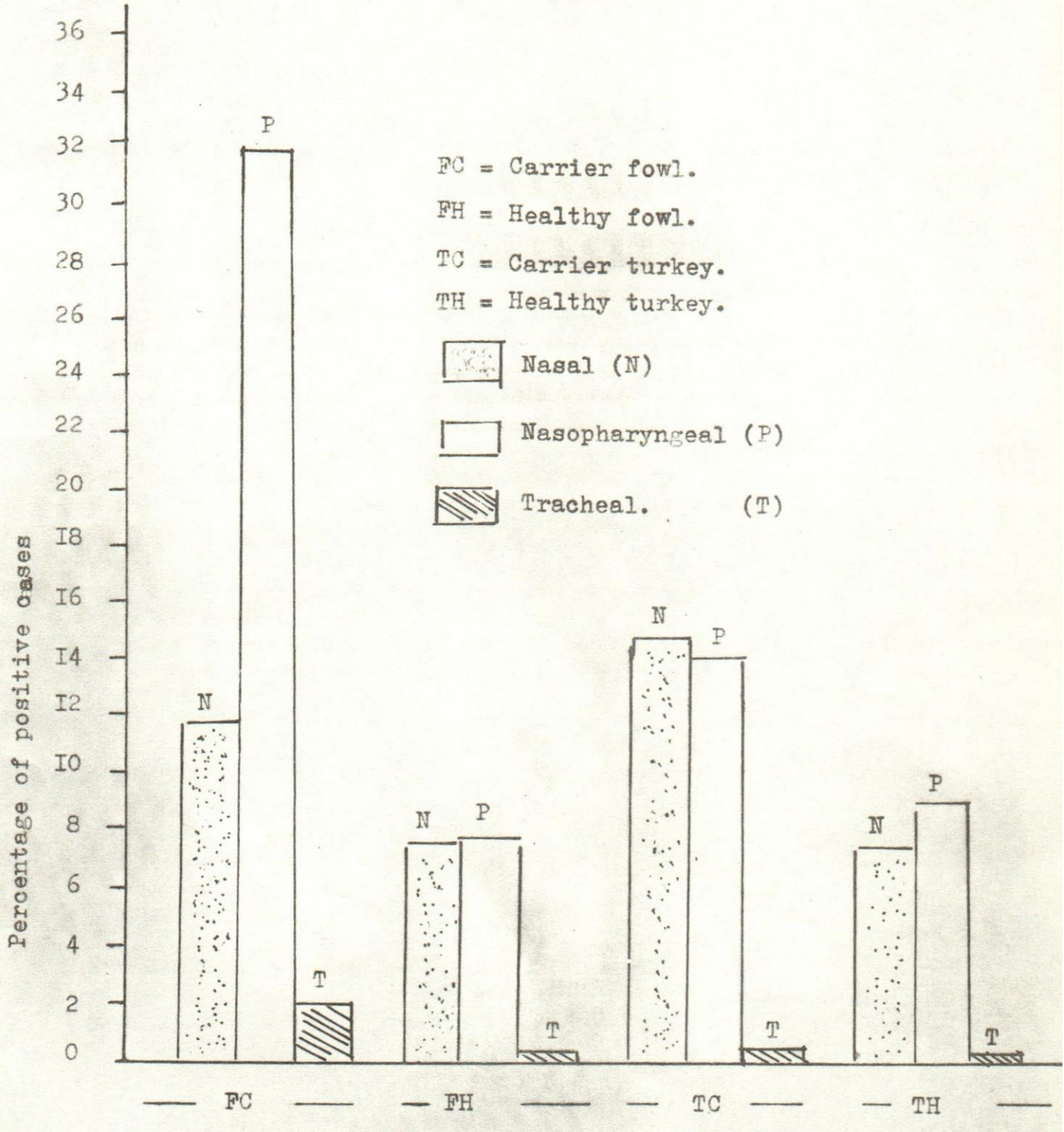

Figure (I). Incidence of P. multocida isolated from swabs collected from healthy as well as from reported infected birds.