Vet.Med.J.,Giza. Vol.43,No.2.(1995): 201-206.

INCIDENCE OF MYCOPLASMAL INECTIONS IN TURKEYS

BY

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SUMMARY

The incidence of mycoplasma infections in turkey flocks from different localities of Egypt was surveyed by testing (150) serum samples and (150) samples collected from lungs, air sacs, tracheas and swabs from cloaca, oropharynx, nasal pasages and sinuses of turkeys of different ages. Serum samples were subjected to serological examination using slide agglutination (SA) and haemagglutination inhibition (HI) tests.

It was found that, out of (150) serum samples 135 (90%) were serologically positive to *M. gallisepticum,* 50 (33.3%) to *M. meleagridis* and 20 (13.3%) were positive to *M. synoviae.*

Isolation and identification of mycoplasma revealed the presence of *M. gallisepticum* in 80 (53.4%) samples, *M. meleagridis* in 42 (28%), while *M. synoviae* was isolated from 14 (9.3%) samples, 6 (4%) isolates were not identified by antisera, but their biochemical pattern suggested *M. iowae.*

The in-vitro sensitivity test indicated that, the examined serotypes was highly sensitive to Lincospectin and kitamox and less sensitive to Oxytetracyclin and Doxycycline.

INTRODUCTION

Mycoplasmosis is one of the costliest disease problems confronting the poultry industry. The first accurate description of the disease in turkeys was probably made by Dodd (1905) in England under the name "epizootic pneumoenteritis". Dickinson and Hinshaw (1938) named the disease "infectous sinusitis" of turkeys. The pathogenic mycoplasmas affecting turkeys are *M. meleagridis, M. gallisepticum, M. synoviae and M. iowae.*

M. meleagridis (MM) has been incriminated as a causative agent of airsacculitis in turkey poults (Bigland et al., 1964; Kumar et al., 1963); Yamamoto and Ortmayer 1967). Also, Yamamoto et al., (1965) indicated that one site of infection in the adult female was the oviduct and from there the organism had access to the developing embryo. In the male, the organisms may be present in the phallus, gain access to the semen, and disseminted rapidly during artificial insemination (Yamamoto and Bigland, 1964 and 1966).

M. gallisepticum (MG) infection, causes disease of turkeys of various age characterized by severe sinusitis and airsacculitis (Reis and Yamamoto, 1971). Accumulation of nasal discharge in infraorbital sinuses leads to swelling of head and closing of eyes (Domermuth et al., 1967).

M. synoviae (MS) infection of turkeys is associated with a disease called infectious spnovitis or infectious bursitis (Olson et al., 1954).

M. iowae (MI) is generally associated with reduced hatchability and embryo mortality in turkeys and induces mild to moderate airsacculitis and leg abnormalities under expermental conditions (Kleven, 1991).

MM. MG. and MS are transmitted through the egg by transovarian infection (Hofstad, 1974; Glisson and Kreven, 1985; Yoder and Hofstad, 1964), while for MM and MI infection may spread venereally through insemination of infected semen (Bradbury ad Ideris, 1982; Yamamoto, 1967 and 1978).

Several workers have investigated the incidence of mycoplasma infections among chicken and tarkey flocks in Egypt (El-Ebeedy, 1973; Abd El-Rahman, 1980 and 1985).

The present study was conducted to investigate the incidence of mycoplasma infections in turkey flocks by serological examination for antibodies and isolation trials for the causative organisms. In-vitro sensitivity tests were applied to determine the effect of antibiotics on isolated strains.

MATERIALS AND METHODS

A total of 150 serum samples were collected randomly from three flocks of turkey from differnt localities of Egypt including turkeys from Faculty of Agriculture, Cairo University. Flock I (8-12 months) was apparently normal, flock II (4-6 months) suffering from severe sinusitis and flock III (2 weeks - one moth) was with respiratory disorders. Also, 100 swabs were collected from living and dead birds from the three flocks from sinuses, oropharynx, nasal passages and cloaca, together with 50 samples from lungs, air-sacs and tracheas. Samples were cultured on Frey's medium (Frey et al., 1968) and heart infusion medium (Sabry et al., 1971). Genus determination was made as described by Erno and Stipkovitis (1973) using digitonin test. Characterization tests were performed according to Sabry (1968) and serotyping, using growth inhibition test (GI) according to Clyde (1964).

Serum samples were sxamined by slide agglutination (SA) and haemagglutination inhibition (HI) tests for MG, MS and MM as described by Vardaman and Yoder (1969). Stained antigens for MG and MS were obstaind from intervet. International B. V., Boxameer, Holland. MM agglutinating antigen and the HI antigens were prepared sccording to Vardaman and Yoder (1969). In-vitro sensitivity test was applied to (5) isolates from each recovered serotype. Sensitivity discs produced by Oxoid Laboratories, England and Upjhon Company, U. S. A. were used. Doxycycline discs were prepared from Vibravet produced by Pfizer, New York. The test was carried out according to Clyde (1964).

RESULTS

The results of the serological examination in table (1) showed that, out of 150 serum samples 135 (90%) were positive to MG, while 50 (33.3%) were positive to MM and 20 (13.3%) were positive to MS.

Table (2) shows that, MS was isolated out of 150 swab and tissue samples 80 (53.3%), MM from 42 samples (28%) and MS was isolated from 14 samples (9.3%), 6 (4%) isolates were not identified by antisera, but their biochemical pattern of them suggests *M. iowae*. The results of the sensitivity test as shown in table (3) indicated that, examined serotypes wer highly sensitive to

Table (1): Results of serological examination.

	SA			HI		
	MG	MM	MS	MG	MM	MS
FI	40/40	15/40	0/40	31/40	13/40	0/40
FII	55/60	20/60	15/60	48/60	13/60	10/60
FIII	40/50	15/50	5/50	10/50	10/50	3/50
Total	135/150	50/150	20/150	89/150	36/150	13/150
%	90.0	33.3	13.3	59.3	24.0	8.6

Table (2): Isolation rate of mycoplasma.

	FI					FII					FIII				
	No. Ex.	MG	MM	MS	UnI.	No. Ex.	MG	MM	MS	UnI.	No. Ex.	MG	MM	MS	UnI.
Sinus	40	40	0	0	0	40	40	0	0	0	0				
Oropharynyx	0					2	0	0	0	0	0				
Nasal	0					2	0	0	2		0				
Cloaca	6	0	4	0	1	10	0	6	0	2	0				
Lung	2	0	2	0		3		2	1		15	0	10	3	1
Air sac	2	0	2	0		3			1		15	0	10	3	2
Trachea	2	0	2	0		3			2		5	0	2		

Total No. Ex.	MG	%	MM	%	MS	%	Not identified	%
150	80	55.3	42	28.0	14	9.3	6	4.0

Table (3): Results of sensitivity test.

Antibiotic test	Mean inhibition zone (cm)		
	MG	MM	MS
1. Lincospectim 30 µg	2.0	2.0	2.0
2. Oxytentracycline 30 µg	1.0	1.0	1.0
3. Streptomycin 10 µg	0.5	0.5	0.5
4. Doxycycline 30 µg	0.6	0.6	0.6
5. Ketamox 30 µg	1.5	1.5	1.5
6. Amoxicillin 25 µg	0	0	0

MG: M. gallisepticum MM: M. meleagridis MS: M. synoviae.

Lincospectin and Kitamox and less sensitive to Oxytetracycline and Doxycycline.

DISCUSSION

It is clear from the results of serological examination, isolation and identification that mycoplasmosis in turkey flocks constitutes an important economic problem. The results of the serological examination showed that, there is high incidence of MG (90%) and MM (33.3%) by the use of SA test, while HI test revealed that, MG was (59.3%) and MM (24%), which confirms that the infection is endemic in turkey flocks. These results are in agreement with those of Carpenter et al., (1981), El- Ebeedy (1977), Jordan (1975) and Yamamoto (1967). Because the SA test is a mass-screening test to detect flock infection, giving a rough estimation of infection level, Thornton et al. (1975) have suggested the use of the haemagglutination inhibition test as a means to increase serologic specificity. There is a high isolation rate of mycoplasmas (table 2) in the three flocks. MG was isoalted from all examined sinuses (100%), from apparently normal birds and those with clinical disorders. MM was isolated from flock I with high rate than the other two flocks. The isolation sites were lungs, air-sacs, tracheas and cloaca. The isolation rate revealed that MG was isoalted from (53.3%) of 150 sampled swabs and tissues, MM from (28%) and MS from (9.3%). Since there are no recognizable clinical signs associated with infection of older birds (flock I). serologic and cultural procedure will be the basis to the disease status of breeder flocks. The results of the in-vitro sensitivity test indicated that the examined serotypes were highly sensitive to lincospectin and kitamox and varied from sensitive to weak sensitive to other antibiotics. It was found that lincospectin was effective in inhibiting or reducing mycoplasmal colonization in the air sacs, furthermore, the activity of lincospectin in vitro appeared mycoplasmicidal in nature (Hamdy et al., 1970 and 1980; Lin 1987).

Embryonic infection with MM in turkeys has been associated with increased embryo mortality and a variety of skeletal and developmental problems in growing poults (Edson et al., 1979; Hansen, 1971). MM infection of the embryo was estimated to result in a 5% decrease in salable poults (Carpenter et al., 1981).

Moreover, MM has been shown to have an immunosuppressive effect on the B-cells of the bursa of Fabricius in young turkey poults with reduced production of IgG (Ortiz and Yamamoto, 1981). Also, MS when associated with generalized disease, can cause atrophy of both the bursa of Fabricius and the thymus (Jordan, 1981). Bradbury (1984) has shown that MI also has an immunosuppressive effect on turkeys.

So, for improving the local poultry industry, mycoplasmal infections, which interact with bacterial and viral infections, must be controlled in poultry farms by adopting eradication program on a national scale.

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