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ETIOLOGICAL STUDY ON EGG PERITONITIS OF LAYING AND PARENT STOCK HENS

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ABSTRACT

The aim of this study was to diagnose the etiologic agents of egg peritonitis. Sixty one chicks affected with egg peritonitis were examined clinically, pathologically, microbiologically and serologically. The results showed swelling of abdomen redding of skin, and abduction of legs. Necropsy showed peritonitis with presence of blood stained or caseated material.

The results of serology (ELISA) was negative for infectious bronchitis, Mycoplasma, Influenza and egg drop syndrome.

The microbiological examination revealed the presence of *Proteus vulgaris* (3 cases) (4.91%), *Staphylococcus aureus* (9 cases) (14.75%), *Escherichia coli* (48 cases) (78.68%) and *Acinetobacter calcoaceticus* (one case) (1.63%).The results of sensitivity test has been discussed.

دراسة لمسببات التهاب البريتونيوم في الدجاج البياض والامهات

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الخلاصة

استهدفت هذه الدراسة تشخيص الأسباب المؤدية إلى التهاب البريتونيوم في الدجاج البياض والامهات وقد تم جمع (61) حالة مصابة بالتهاب البريتونيوم وفحصت سريريا" ومرضيا" عيانيا" وسيرولوجيا" ومايكروبايولوجيا". بينت النتائج تورم التجويف البطني مع احمرار الجلد وتباعد الأرجل عن بعضها وعند الفحص لوحظ وجود التهاب البريتونيوم مع وجود سائل احمر أو مادة جبنية في البطن. أما نتائج الفحص السيرولوجي (الاليزا) فكان سلبيا لأمراض التهاب القصيبات المعدي والمايكوبلازما والانفلونزا ومتلازمة نقص البيض. وبينت نتائج الفحص

الجرثومي تشخيص كل من جراثيم المتقلبات (3 حالات)، المكـورات العنقوديـة الذهبية (9 حالات)، الاشريكيا القولونية (8 حالات) و اسبيتوباكتر كالكوا سيتكس (حالة واحدة)، ودرست حساسية الجراثيم للمضادات الحيوية وتم مناقشتها.

INTRODUCTION

The reproductive system was studies in last decade by many workers including egg peritonitis. Egg peritonitis is the causes of high economic losses due to high antibiotic price, low egg production and high mortality (1). Many factors interfere by direct or indirect in producing egg peritonitis (2). The important of these factors are : infectious bronchitis (3) egg drop syndrome, Salmonella species (4), Pasteurella species (5), *Mycoplasma gallisepticum* (6), *Staphylococcus aureus*, Streptococcus species (7), Influenza virus (8) and *Escherichia coli* (4). The aim of this study was to detect the causative agents of egg peritonitis.

MATERIALS AND METHODS

This study was conducted in the years 2004, 2005 and 2006 in Mosul province in flocks of laying and parent stocks. Sixty one samples were obtained from hens showing the symptoms of dullness, swollen of abdomen faraway the legs from abdomen, redding of the skin and fever. Necropsy was made under aseptic condition. The bacteriological samples from peritonitis, oviduct and intestine were taken.

Bacterial examination: Culturing were carried out under aerobic and anaerobic condition on liquid media (nutrient broth and brain heart infusion broth) and solid media. Bacterial strains were identified by using morphological, cultural, and biochemical tests according to (9, 10, 11).

ELISA test: was performed to exclude infectious bronchitis, egg drop syndrome, mycoplasma and influenza and on later time Antigen Rapid Avian Influenza Virus Antigen Test Kit Manufactured by Animal Genetics, incorporation Korea, using cloacal swab method to check influenza.

Postmortem examination: was done to detect any gross lesions in the peritoneum, intestine, and oviduct.

Sensitivity test: Sensitivity to antimicrobial agents was tested by the disk diffusion method on Mueller – Hinton agar and as described by (12) and modified by (13). The antibiotic tested were Ampicillin (AMP 10 µg/ml), Ciprofloxacin (CIP 5 µg/ml), Enrofloxacin (EN 5 µg/ml), Erythromycin (E 15 µg/ml), Furaltadone (F 30 µg/ml), Gentamicin (GN 10 µg/ml), Imecaine (I 10 µg/ml), Norfloxacin (No 5 µg/ml), Oxytetracycline (OT 30 µg/ml) and Trimethoprim (Tr 25 µg/ml).

RESULTS

Postmortem examination of most cases affected with egg peritonitis showed thickening of peritoneum due to congestion and odema and lack of transperncy. Some cases showed adhesion of peritoneum to the

intestine. The abdomen contained exudates (Fig-1). The nature of the exudates vary in consistency from turbid fluid to caseated material with bad odour (Fig-2). Some time this exudates was tane with blood and other time greenish black in colour (Fig-2). In the peritoneal cavity, free egg yolk was seen and this yolk was surrounded by caseated material. The skin of abdomen was red and the muscle was congested. The liver and spleen were congested. The result of ELISA test for infectious bronchitis, influenza, egg drop syndrome and mycoplasma infection were negative. Antigen Rapid Avian Influenza Virus Antigen test KIT, the result of cloaca faces swab was negative. Bacteriological Examination, hens showing postmortem examination positive cases of egg peritonitis and that were tested bacteriologically contained the following microorganisms: Out of 61 cases organisms isolated were *E. coli* (48 cases), (78.68%), *Staphylococcus aureus* (9 cases) (14.75%), *Proteus vulgaris* (3 cases) (4.91%), *Acinetobacter calcoaceticus* (one case) (1.63%), table (1). The results of sensitivity test was clear in table (2) for each type of bacteria.

Table 1: Bacteria isolated from egg peritonitis.

	No. of cases	*Staphylococcus aureus*	*Escherichia coli*	*Proteus vulgaris*	*Acinetobacter calcoaceticus*
Laying	47	7	38	2	-
Parent stock	14	2	10	1	1
Total No.	61	9	48	3	1

Table 2: The results of the *in-vivo* sensitivity test for the isolated bacteria

Antibiotics	*Staphylococcus aureus*	*Escherichia coli*	*Proteus vulgaris*	*Acinetobacter calcoaceticus*
Ampicillin	R	R	R	R
Ciprofloxacin	I	S	S	I
Enrofloxacin	S	S	S	I
Furaltadone	S	I	R	R
Gentamicin	R	S	S	I
Imequyl	R	I	I	R
Oxytetracycline	S	R	R	I
Norfloxacin	S	R	R	I
Trimethoprim	I	S	I	I
Erthromycin	S	R	R	S

R= Resistant; S= Sensitive; I= intermediate

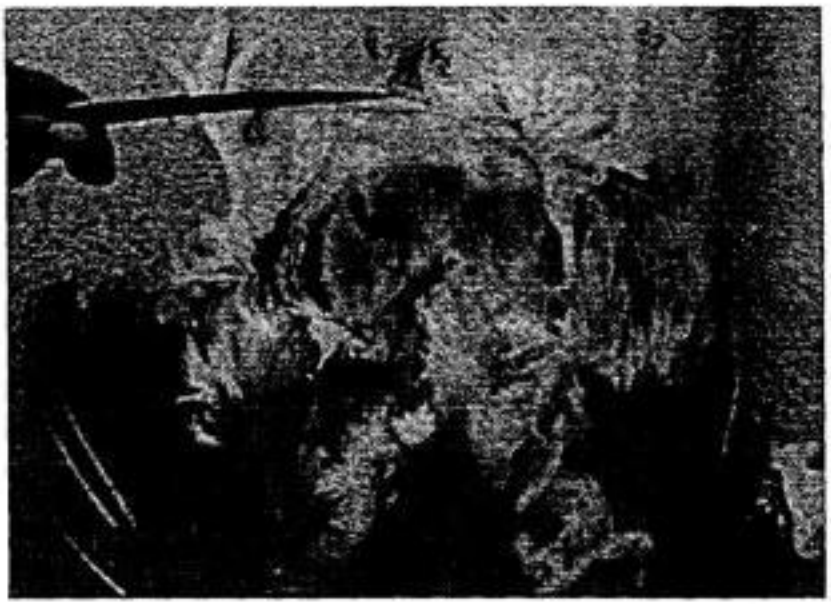

Figure 1: Accumulation of exudates in the abdomen

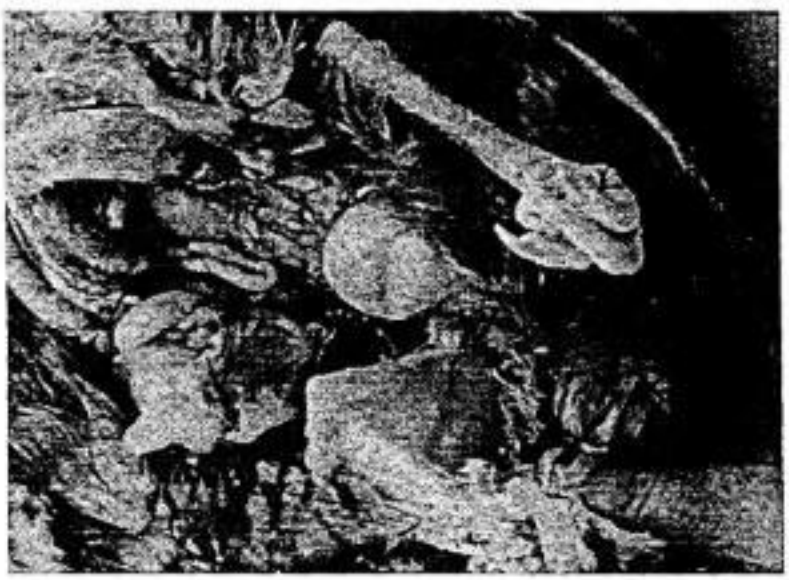

Figure 2: The exudates caseated in nature with adhesion of intestine

DISCUSSION

Several infectious agents are considered to be the causes of egg peritonitis in laying and parent stock hens which cause problem and observed in several flocks in Mosul province (14). There are many agents incriminated in such problem and this in agreement with (15). Concerning the microorganism *E. coli, Staphylococcus aureus, Proteus vulgaris* but the newest thing in this research is the detection of *Acinetobacter calcoaceticus* fore the first time.

This may be the cause of the failure of treatment in the field cases in the last few years and recurrence of the disease condition in spite of the use of the most common drugs. Therefore, this study was done to isolate the possible associating bacterial agents and study their in vitro sensitivity to get the suitable treatment. It seem that presence of egg yolk helps in the multiplication of microorganisms to set up the lesions and initiation of this changes which is in agreement with (16). There is no significant alteration in alkaline phosphates, this different from the observation by (17), this may be due to good production and no change in calcium. In conclusion the present study adds further evidence about *Acinetobacter calcoaceticus* infection beside others organism causing egg peritonitis.

REFERENCES

1. Singh MP, Mehrotra RI, Prasad CB, Prasad LN. Studies on the incidence of egg peritonitis, salipingitis and oophoritis in laying hens. Ind Vet J 1977; (1): 38-42.
2. Nile H. Follicular atresia and ovarian diseases in domestic chicken. Ph.D. Thesis, Department of Veterinary Pathology, Queensland University, Australia 1995; 89-122.
3. Riddell C. Avian Histopathology. 1st Ed., American Association of Avian Pathologists. Kennett Square, Pennsylvania, USA 1987; 83-87.
4. Jones HGR, Owen DMC. Reproductive tract lesions of the laying fowl with particular reference to bacterial infection. Vet Record 1981; 10: 36-37.
5. Shirapprasad HL. Fowl typhoid and pullorum disease. Int J Epidemiology 2000; 19 (2): 405-424.
6. Nunoya T, Kanai K, Yagihashi T, Hoshi S, Tajima M. Natural cases of Salipingitis apparently caused by *Mycoplasma gallisepticum* in chicken. Avian Pathol 1997; 26: 391-398.
7. Peckman MC, Shanma DN, Singh CM. Study on the pathology of female genital that of poultry with special reference to egg peritonitis n dicirene pathoanatomy slnaty. Indian J Vet Sci Anim Husbundory 1968; 38: 737-746 of Streptococcosis in while nock chic hens Avian Dis., 10 (4): 413-421.
8. Ziegler AF, Davidson S, Aclgnd A. Characteristic of HI N2 avian influenza virus infection in commercial layers in Pennsylvania. USA. Avian disease 1997-1998; 43 (1): 142-149.

9. Baron EJ, Finegold SM. Bailey and Scotts Diagnostic Microbiology. 8th ed., C.V. Mosby Company. St. Louis, USA 1990; pp: 18-126; 368-370.
10. Holt JG, Krieg NR, Sneath PHA, Staley JT, Walliams ST. Bergey's Manual of Determinative Bacteriology. 9th ed., 1994; A Wolters Kluwer Company, Philadelphia, Baltimore, New York, London.
11. Collee JG, Marmion BP, Fruser AG, Simmons A. Mackie and McCartney Practical Medical Microbiology. 4th ed., 1996; Longman Singapore Publisher, Ltd., Singapore.
12. Bauer AW, Kirby WAM, Sherris JS, Turk M. Antibiotic susceptibility by standardized single disk method. American J Clin Pathol 1966; 45: 493-496.
13. Vandepitte J, Engbaek K, Piot P, Hench CC. Basic Laboratory Procedures in Clinical Bacteriology. World Health Organization, Geneva, Switzerland, 1991; pp: 31-36; 78-95.
14. Alaboudi AR, Hammed DA, Basher HA, Hassen MG. Potential pathogenic bacteria from dead – in –shell chicken embryos. Iraqi J Vet Sci 1992; 5:109-114.
15. Nile H, Mahjong H. Histopathological and Bacteriological studies on the cull laying hens reproductive system Iranian. J Vet Res 2005; 6(3): 84-90.
16. Sharma DN, Singh CM. Study on the pathology of female genital tract of poultry with special reference to egg peritonitis. Pathoanatomy and experimental 1986; 10: 313-321.
17. Simkiss K. Calcium in Reproductive Physiology. 1st Ed., Chapman and Hall Ltd., London, UK 1967; pp: 193.