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Retrospective study of causes of respiratory infections in broiler chickens which presented to Babylon veterinary hospital during 2012

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Abstract:

The object of this study to diagnosis the causes of respiratory infection in broiler chickens which prevalence in Babylon province during 2012, the diagnosis is depending on case history, clinical signs, postmortem lesion and confirmed by rapid diagnostic kit and enzyme linked immunosorbant assay (ELISA), the results show the causes of respiratory infection are (infectious bronchitis (IB), Newcastle disease(ND), avian influenza(AI) and chronic respiratory disease(CRD) in percentage (29.7, 27.9, 25.2 and 17) respectively . In conclusion of this study that respiratory infections are the major threaten for poultry industry in Babylon and poor biosecurity are major predisposing factors for this diseases.

Key ward : Retrospective ,Respiratory infection , broiler,badylon.

دراسة لتحري الاصابات التنفسيية في دجاج اللحم الواردة الى المستشفى البيطري في محافظة بابل خلال عام 2012

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الخلاصة:

ان الهدف من اجراء هذه الدراسة هو لتشخيص مسبات الاصابات التنفسية المنتشرة في محافظة بابل خلال عام 2012 حيث تم التشخيص عن طريق معرفة تاريخ الحالة المرضية و العلامات السريرية والصفة المرضية وتم تاكيد التشخيص عن طريق العدة التشخيصية السريعة وفحص الاستشراب المناعي الممتص، اظهرت النتائج ان مسببات الاصابات التنفسية هي التهاب الشعب الهوائية المعدي ، مرض نيوكاسل ، انفلونزا الطيور و المرض التنفسي المزمن وان النسبة المئوية لها 29,9 و 27,9 و25,2 و17 على التوالي واستنتجت الدراسة ان الاصابات التنفسية تعتبر المهدد الرئسي لصناعة الدواجن في محافظة بابل وكذلك ان ضعف اجراءات الامن الحيوي تعتبر من اهم المهيئاة لحدوث هذه الامراض .

Introduction:

Poultry is an important source of meat in the world and the consumption of poultry products is still increasing for that broiler breeds are selected for their rapid growth; broiler chicks are growing from 50 g at day of hatch to more than 2 kg within 6 weeks (1; 2). The rapid growth and high flock density lead to decrease immunoresponse that might explain the frequent occurrence of variety diseases in modern broiler chickens (3).

The respiratory system of chickens exposed for several diseases, these diseases cause by different causative agents like

viral disease as Newcastle disease (ND), infectious bronchitis (IB), avian influenza (AI) and infectious laryngotrachatis disease (ILT), bacterial disease as *Escherichia coli*, fowl cholera (FC) and infectious coryza (IC), mycoplasma infection like *mycoplasma gallisepticum* (MG), Chlamydia infection as *Chlamydia psittassi*, fungus infection as *spergillus fumigetus* and parasite infestion as *syngmus trachea* (4).These diseases cause severe damage in different tissue in respiratory tract that lead to appear clinical signs (gasping, sneezing ,coughing, nasal discharge, respiratory distress) and gross lesions (sinusitis, congestion of trachea and contain serous or mucous, cheesy material, congestion in lungs or pulmonary emphysema and different degree of airsaculitis (5) . The severity of respiratory disease depended on several factors including (virulence of causative agent, age of bird, immune states of flock, density of flock , environmental condition and secondary infection). In the last ten years , many respiratory infections prevalence in middle Euphrates cause severe economic loss in poultry industry characterized by high mortality rate, increase food consumption, decrease weight gain , increase food conversion factor , increase condemnation rate at processing and increase cost of treatment and prevention programs without stopped the spread of infection (6) therefore the object of this study is investigated the prevalence of respiratory infections in Babylon province.

Materials and methods:

This study was depended on records of Babylon veterinary hospital during 2012, the diagnosis of diseases in hospital including :

1- Clinical diagnosis which depended on:

a- Case history which is including the name of owner, position of farm, farm distance, source of chicks, number of bird, source of ration and water, mortality rate, environmental condition in farm (temperature, humidity, ventilation), vaccination program and previously treatment. than analysis the results of diagnosis with suitable aim of study.

b- External examination which included examination live sick bird from head until the vent for recorded all clinical sign that showed in sick bird.

c- Internal examination performance after sick chicken sacrificed and dipping in sterile, all gross lesions showed in sinus, larynx, trachea, bronchi, lungs , air sacs and other organs were recorded.

2- Laboratory diagnosis which included :

a- Bacterial isolation carry out after different swabs took from sinus, trachea and air sac.

b- Rapid kit, it is a chromatographic immunoassay for the qualitative detection of ND, IB and AI viruses antigens in avian trachea, kidney, feces samples preformed for established the causative agent according to manufacturer instructions.

- LilliTest Rapid NDV Ag Test kit Lillidale/ England
- Anigen rapid IBV Ag Test kit BioNote / Korea
- Influenza virus antigen one-step/ European veterinary laboratory/Netherlands

c- Indirect Enzyme Linked Immunosorbent Assay (ELISA) which is a rapid serologic test for the detection of ND, IBV and AI antibodies respectively in chicken serum samples. The procedure was performed according to the manufacturer instructions listed in the ProFLOK® ND, IBV and AI ELISA Kit (Symbiotic–USA),

The results:

When the data were collected from the records of Babylon veterinary hospital during 2012, the data analysis for that the results show the number of broiler chickens suffering from respiratory infections are 3468 cases out of total number 5847 cases that constituted

59.31%. These cases classified according to monthly recorded during 2012 as appear in table (1).

Table 1 explain number of respiratory infection case that presented to Babylon veterinary hospital during 2012

month / Disease	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug,	Sept.	Oct.	Nov.	Dec.	Total	Per (%)
AI	112	73	80	75	43	85	32	60	100	70	70	75	875	25.23
ND	75	100	60	90	50	100	90	50	70	80	105	100	970	27.97
IB	71	112	40	80	100	80	100	100	50	100	110	90	1033	29.79
CRD	35	75	50	40	80	45	30	80	20	40	35	60	590	17.01
Total	293	360	230	285	273	310	252	290	240	290	320	325	3468	100
Percen (%)	8.44	10.38	6.63	8.21	7.87	8.93	7.26	8.36	6.92	8.36	9.22	9.37		

The case history discovered that all owners of poultry farms applied different vaccination programs for protected their birds against infectious diseases and their farms suffering from poor biosecurity precautions. The clinical signs recorded in these cases were varied from mild respiratory signs (serous nasal discharge, ocular discharge) to sever respiratory signs (gasping, sneezing, coughing, conjunctivitis, closed eyes, purulent nasal discharge , head swelling, swelling infra orbital sinus), nerves signs, diarrhea as well as depression , reluctant movement , ruffled feathers. The morbidity rate reach about 100%, but the mortality varied from 30-100%.

The postmortem lesions varied from mild sinusitis to purulent sinusitis, mild to severe congestion in trachea mucosa (figure 1) , in some time mucoid, purulent ,casease material in trachea, as well as find caseous material obstruction the bifurcation of trachea that lead to asphyxia of bird , congestion in lungs, hydropericardium, fibrenous pericardium, different degree of airsaculitis (figure 2) , fibrenous perihepititis (figure 3) ,fibrenous peritonitis, splenomagally (figure 4), petichial hemorrhage found in several organs (epicardium, proventriculus , gizzard).

Fig1:photograph expline congestion in trachea

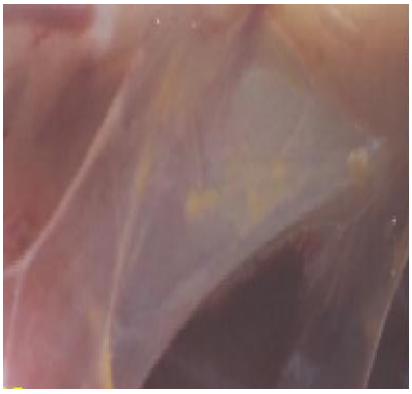

fig2: photograph expline cloding in air sac

Fig 3: photographexpline hepatomagaly and fiprenous periheptitis

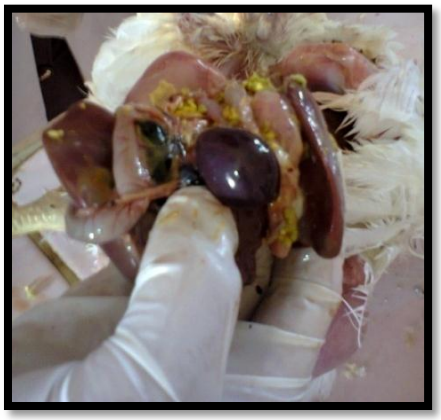

Fig 4: photograph expline splenomagaly

All the clinical signs and postmortem lesions are not pathogenomic lesion and cannot depended alone in diagnosis and identification specific disease for that confirmed with rapid diagnostic kit which consider reliable and rapid test according(7) and ELISA . The results of rapid diagnostic kit and ELISA classified that respiratory infection to (AI, ND and IB), in some cases result of the rapid kit show positive reaction for (AI. ND and IB) in same case also can isolate *Escherichia coli* from that case for that these case recorded as chronic respiratory disease as show in table 1 .The percentage of respiratory diseases recorded monthly along period of study as show in figure 5 . The percentage of each disease show in figure 6.

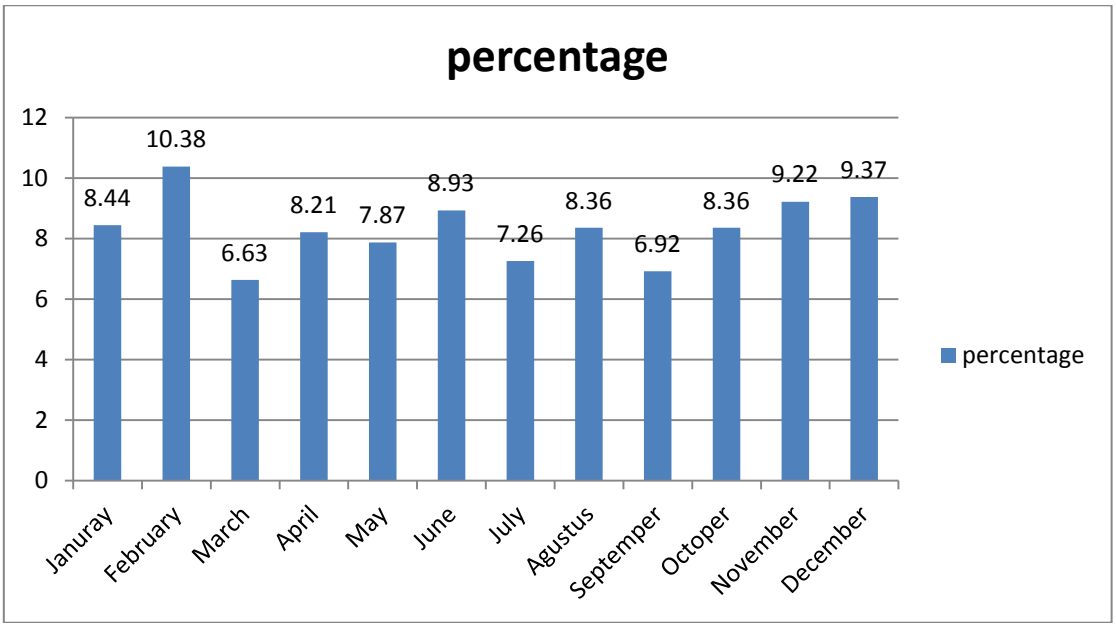

Figure 5 expline monthly percentage of respiratory diseases that diagnostic in babylon veterinary hospital in 2012.

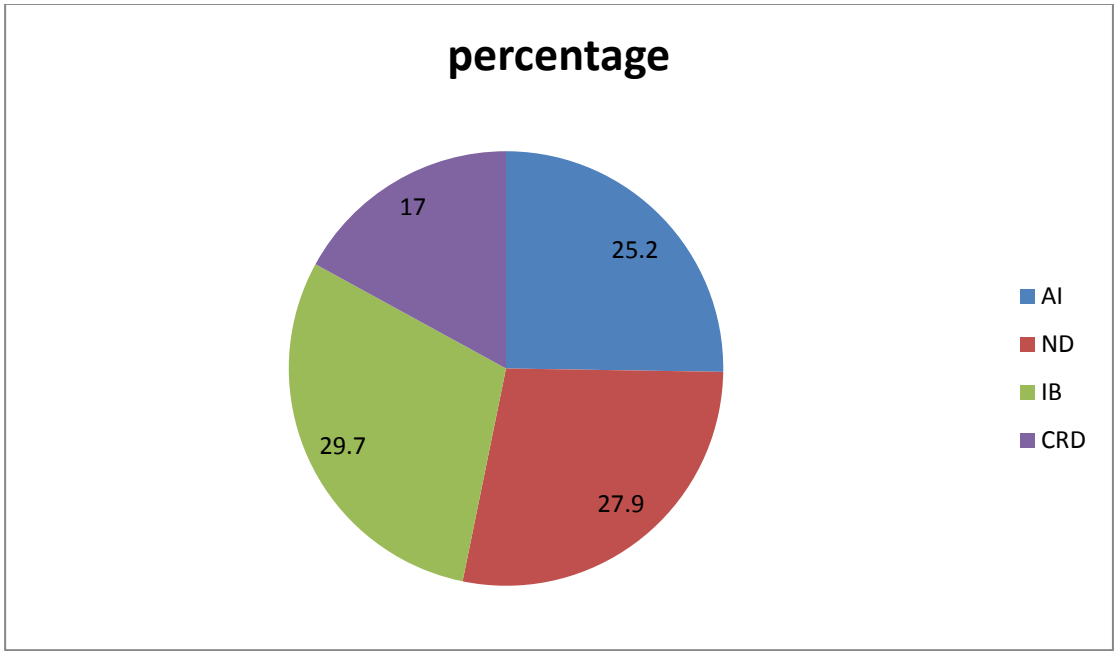

Figure 2 expline percentage of respirtory disease case that presented to babylon veternary hospital during 2012.

Discussion:

The respiratory diseases are largest importance problem bring extensive economically harm to poultry industry worldwide due to highly spread, highly mortality and difficult in prevention and control (8, 9).

The poultry industry in Iraq exposed to many of respiratory infection outbreaks after 2003 due to largest open of Iraq in world countries and absent of hygiene quarantine that lead to entrances of different types of birds(hope, domestic and

wild bird) and pets animal which might carrier many diseases also import different types of vaccines without significant control , these outbreak characterized by high mortality, and similar clinical signs and pathologic lesions in spite of used different type of antibiotic and applied different vaccination programs against ND,IB,AI but continuous problems (7;10;11; 12; 13). Also, many outbreaks occur in Babylon province but did not presented study point to diagnosis the causes of this outbreak for that this study objected.

The results of present study show the total number of sick broiler chickens which brought to Babylon veterinary hospital during 2012 were 5847 cases affected with different diseases while the total number of chickens affected with respiratory infection were 3486 case (table 1) ,this number constitute 56.4 % , this percentage reversible the importance of the respiratory infection and its dangerous in poultry industry in Iraq , the interpretation for the result may be due to pens building very old , destruction, absent the biosecurity , or may be due to rapid growth of broiler chickens with crowding density this lead to easily exposed to infectious diseases this interpretation corresponding with (14; 15) who suggested that continuous successful selection of broilers for rapid growth has resulted in less disease resistance and overall immunocompetence, this result agree with the result that reached by (16) who referred the percent of respiratory diseases is 44.44%

Also , the result show the respiratory diseases in months February , November and September (10.38%, 9.22% and 9.37% respectively) recorded higher percentage than other months in 2012 (figure 1) the interpretation for this finding may be due to decrease temperature, increase humidly during winter season as well as , crowding, bad ventilation, unbalance ration , inproper vaccination route practically when vaccination against IBV via spray method due to this vaccine may be increase susceptibility to infection with colibacillosis (17;18), present secondary infection specially *E. coli* and immunosuppression diseases like infectious bursa disease, mycotoxin all these factors are predisposing to respiratory infection. This interpretation corresponding with researcher (19) who referred to as broiler poultry industries developed, almost the chickens are grown in high crowded with low air conditioned houses. In such situations many of the flocks which infected by MG, become predisposed or their disease condition have been aggravated. After predisposing the air sacs to Mycoplasma or other virus infections,colibacillosis developed and the chronic respiratory disease CRD complex occurs .

The results of rapid kits and ELISA test classified the respiratory disease in this study to IB, ND and AI while the CRD diagnosis depend on typical gross lesion and bacteriological test (isolation of *E.coli*). through the figure 2 obvious the percentages of respiratory diseases as following 29.7, 27.9, 25.3 and 17 for IB, ND, AI and CRD respectively . through the figure 6 show IB has the highest percentage (29.7%) despite the most infected flocks vaccinate against IBV, this percentage appear may be due to the IB is contagious respiratory disease, it is rapid spread also, IB has different strains and serotypes , this serotype dose not present cross immunity between them for that when vaccinate with one serotype does not protect against other serotype that lead to immunfailure that interpretation occurrence of disease despite the using different vaccination programs this interpretation correspond with (20) who say that IB remains one of the most widely reported respiratory diseases of chickens worldwide despite the routine usage of attenuated live vaccines to control the disease. Control of IBV is difficult because

there is little cross-reaction between the numerous different serotypes of the virus.

The percentage of ND in this study is 27.9 this percentage irreversible the important of ND in poultry disease, ND is endemic in Iraq and causes several outbreaks in different area in Iraq despite the routine used of vaccination programs that may be due to poor hygiene and biosecurity or due to present of immunosuppression diseases or secondary infection that lead to predisposing to ND this interpretation corresponding with researchers (21; 22) who referred to the immunosuppressive effect of avian influenza virus (H9N2) in occurrence of Newcastle disease despite vaccination against ND, this result agreement with (23) who recorded the percentage of ND infection in broiler chickens in Nynowa province are 28.1%. While as the percentage of AI in present study constituted 25.2% in despite of using varied vaccination programs against AI , this percentage consider highly percentage and adverse the importance of disease in poultry and human , this disease causes high morbidity and mortality rate which may reach to 100% , the cause of appearing this percentage may be due to poor of biosecurity specially uncontrolled on wild bird, aquatic migration bird, which consider natural reservoirs of avian influenza practically the farms, food storage and water source where located in it migration lines. The researcher zahid, 2010 referred to prevalence of AI and recorded highly percentage infection in middle Euphrates area during period 2000 -2008 for that the result of this study corresponded with result of (6).

The mycoplasmosis diseases also, recorded in this study in 17%. The causes of CRD are *mycoplasma gallisepticum* but, when completed with viral respiratory infection(field strain or vaccinal strain) and frequently opportunistic with *E. coli* infection that may be contaminated the food, water and dust interaction among these causative agent lead to appear complex infection called complex CRD. The mycoplasma gallisepticum can transmitted by two ways vertical route from infected layer to their chicks through the eggs and horizontally route contaminated equipment, personals, and drinking water. The MG may be causes mild infection or latent infection when the good management (temperature, density and ventilation) and un complicated infection (24).

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