



Original Research Article

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MYCOPLASMA GALLISEPTICUM INFECTION IN COMMERCIAL LAYER FARMS OF EAST AZARBAIJAN

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ABSTRACT: Mycoplasma gallisepticum (MG) is one of the most important diseases in Iranian poultry industry and all over the world. Mortality, poor weight gain and increasing of feed conversion ratio (FCR) were seen in MG infected flocks, and causes economical losses particularly in layer chickens that were used for egg production. In this study, 36 layer chicken farms located around Tabriz city of Iran investigated during 2016-2017. In each farm, 18 serum samples were obtained. The prevalence of Mycoplasma gallisepticum was studied by RSA test, and the clinical signs and lesions were evaluated in all farms. In RSA test, a drop of antigen (Intervet) and a drop of fresh serum placed side by side with pipette in a glass plate and mixed well by stirring with glass rod, followed by rocking, and then the results documented. Our results indicated that the prevalence of MG in layer farms was 47.22% during study period. Results indicated that the 26.08% of all 648 samples was positive in RSA test. Also in farms infected with MG, drop in egg production were obvious. It can be conclude that MG in layer farms have potency of great economic losses. There was positive relation between flocks size and MG prevalence in sera. The higher rate of MG in layer flocks indicated that these farms do not consider biosecurity and hygienic conditions.

KEYWORDS: Mycoplasma Gallisepticum, Layers, RSA, Seroprevalence.

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1. INTRODUCTION

Poultry industry has an important role in the production of animal protein of excellent quality with low costs. Mycoplasmas are important avian pathogens responsible for chronic respiratory diseases (CRD) and infectious synovitis or bursitis of chickens and turkeys, which result in large economic loss for the world poultry industry. Among the isolated mycoplasmas from poultry, *Mycoplasma gallisepticum* (MG), *M. synoviae* (MS), *M. meleagridis* (MM) and *M. iowae* (MI) are the main pathogenic agents for chickens and turkeys [1, 2]. MG infection causes significant economic losses in the poultry industry due to downgrading of carcasses at slaughter because of airsacculitis, treatment costs, and due to its effect on flocks performance [3, 4], and reduction of egg production in chickens, turkeys and other avian species were reported [5, 6]. MG infection mainly is transmitted through ovaries, and the MG-infected breeder flocks should be depopulated; hence, the preferred method for MG control is to maintain MG-free flocks [7]. However, in some situations such as multi-age production farms, maintaining the flocks free of MG may be difficult or impossible. Thus, the control programs and vaccination account for additional costs. The control programs, which may include surveillance (serology, culture, isolation, and identification) for MG and MS, must be performed, mainly in breeder flocks [5, 8]. Serology is the only reliable tools for detecting the subclinical infection in the flock [9-11]. There are two major Serological methods, which were used for screening poultry farms in Iran, Rapid Serum Plate Agglutination (RSA), and Enzyme Linked Immunosorbent Assay (ELISA); however, there were differences in sensitivity and specificity of these methods [12, 13]. Diagnosis and prophylaxis of avian Mycoplasmosis important because of economic losses. According to Iranian Veterinary Organization rules control of MG is dependent on serologic screening results. It was reported that the prevalence of MG infection in chicken flocks was high and ranging from 42-73%, although isolation of MG ranges from 10-70% [14, 15]. MG seroprevalence in pakisatan layer flocks indicated that the 49.01 percent of flocks was positive [16]. The prevalence of MG in Belgium was 0.9 percent in layers and 1.7 percent in broilers [17]. In Iran 6.25 percent of commercial layers was MG positive [18]. The aim of the present study was to evaluate the seroprevalence of mycoplasma gallisepticum in east Azarbaijan commercial layers.

2. MATERIALS AND METHODS

In this study, 36 broiler farms located around Tabriz city of Iran investigated during 2016-2017. From each flock 18 chickens (a total of 648 samples) were randomly selected for blood collection, 2 ml of blood was collected aseptically from wing vein of each bird and then sera were separated and stored at -21°C until use for RSA test. In all farms egg production rate recorded. All farms that were investigated purchased as MG negative chicks and in day one, they were test by RSA. The RSA test performed with crystal violet stained *M. gallisepticum* commercial antigen obtained from Intervet® Company. One-drop antigen and one-drop fresh serum placed side by side with pipette in a glass plate and mixed well by stirring with glass rod, followed by rocking. Results were read within

2 minutes. In positive cases granules were formed slowly which could be seen during rocking. In the negative case, no such granules were formed. All RSA results were recorded.

3. RESULTS AND DISCUSSION

The results showed that 17 of 36 (47.22%) flocks were MG positive and the rest (52.78%) were negative. Totally 169 of 648 (26.08%) sera was positive, 464 of 648 (71.60%) sera was negative and 15 of 648 (2.31%) was suspect. The relationship and correlation between age and MG prevalence was evaluated by SPSS Statistical software Ver. 22.0. Results demonstrated that the MG prevalence was increase by age in layer farms ($p < 0.05$). Mycoplasma infections are important poultry disease that causes economic losses in poultry production, especially in layers [19]. Purpose of this study was to investigate seroprevalence of Mycoplasma gallisepticum, in naturally infected layer chickens. High prevalence rate of MG infection was reported previously by several studies in poultry farms [20-22] Previously reported that the seroprevalence of MG infection was higher (33.3%) in female than in male (10.14%), which it is indicating that the female birds significantly ($p < 0.05$) were more susceptible than male birds. Isolation and identification of MG in Ghaemshahr town in north of Iran, showed that 20% of broiler farms positive in case of Mycoplasma genus and 12 percent of farms positive in molecular tests [23]. The results of several researches in Iran was indicated that, regardless of the screening of broiler breeder farms and control of MG, still high prevalence of MG present in poultry farms [23, 24]. Previous studies on broiler breeder farms in Iran Also demonstrated high seroprevalence (21.4%) of MG [25, 26]. Also it was reported that the prevalence of MG infection was higher (56.21%) in female than in male (43.79%) [24, 25]. Researchers indicated that the highest prevalence of MG infection was 72.72% in 18-25 weeks age, whereas lowest prevalence was 44.00% in 66 weeks and above ages [20]. Also there were similar reports, which were demonstrated highest MG infection at lower ages and lowest MG infection in later ages [27]. Highest infection in the young chickens, maybe due to the vertical transmission of the organisms, and lowest rate of infection in adult chickens maybe due to infections or unsuitable environmental conditions in flocks. However, intensive nature of poultry farming provided opportunity for recycling of the pathogens due to population density. The other factors that contribute MG infection are poor ventilation, contamination of litters and no restriction on the movement of the technical personnel, visitors and such other persons as well as other biosecurity measures [21]. Overall prevalence of MG in 2012 was 49.38% in Pakistan [16] and this was significantly increased [28]. It was reported that the 58.9% of layer chickens was seropositive for MG infection in Feni District of Bangladesh [29]. Furthermore high seroprevalence rates 45.10% and 81.15 % of MG positive in laying hens of Rajshahi and Batna Districts of Eastern Algeria and its surroundings, respectively, was reported [30, 31]. Due to biosecurity strategy, control and prevention strategy in Belgium the prevalence of MG in layers was 0.9% and in broilers was 2.7%.

4. CONCLUSION

The results of our investigation indicated that the prevalence of MG in layer farms was 47.22% during 2016-2017 period. Results indicated that the 26.08% of all 648 samples was positive in RSA test. The results demonstrated that the high rate of layer flocks was MG positive and the control program was not effective thoroughly, but decrease the seroprevalence of MG in layer flocks. It is suggested that proper management and improvement of biosecurity in layer flocks should be managed to control of MG infection.

CONFLICT OF INTEREST

We have no conflict of interest to declare.

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