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Therapeutic management of Turkey pox using ethno-veterinary herbal preparations

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Abstract

Turkey pox is economically important disease and is caused by Avipox virus of the family Poxviridae. An outbreak of turkey pox in a turkey farm was recorded. 41 turkey poults showed droopiness, ruffled feathers, reduced appetite and body weight, fever and nodular lesions on head, face and neck. The size of the nodular lesions were between 3 mm to 6 mm diameter. Histopathological examination of the nodular lesions showed intracytoplasmic eosinophilic inclusion bodies. Affected birds were treated with oral and topical ethno-veterinary herbal preparations. Oral paste was prepared with Cumin seeds (*Cuminum cyminum*), garlic pulp (*Allium sativum*), black pepper (*Piper nigrum*), turmeric power (*Curcuma longa*), leaves of *Moringa oleifera*, *Azadirachta indica* and *Ocimum sanctum*. Topical application was prepared from leaves of *Ocimum sanctum*, *Azadirachta indica*, *Moringa oleifera*, garlic cloves, turmeric powder, seeds of cumin and camphor (*Cinnamomum camphora*) were mixed and ground well and was heated with 100 ml of castor oil (*Ricinus communis* seed oil) and 100 ml of neem oil (*A. indica* seed oil). All the birds were showed marked recovery on fourth day of treatment.

Keywords: Pox, turkey pox, ethno-veterinary medicine

Introduction

Turkey pox is one of the economically important diseases affecting turkeys and is caused by Avipox virus of the family Poxviridae. The lesions are mainly located in unfeathered skin and in diphtheritic form having lesions are in mouth, oesophagus, pharynx, larynx and trachea (Tripathi and Cunningham, 1984) ^[1]. Recently, the Ethno-veterinary medicine is getting more popular in the veterinary field with the natural and economical method to treat many diseases under field conditions (Sribalaji and Vikramachakravarthi, 2010; Sakthi Priya and Gopala Krishna Murthy, 2017) ^[2, 3]. For the treatment of turkey pox, the combination of different parts of herbs were used both oral administration and topical application (Basheer Ahamed *et al.*, 2013) ^[4]. This paper describes about the treatment of turkey pox in turkey poults by using ethno-veterinary herbal medicine.

Materials and Methods

An outbreak of turkey pox in a turkey farm near Tirunelveli, Tamilnadu was investigated. Out of 124 turkey poults, 41 turkey poults were showed pox lesions in unfeathered areas such as head, face and neck. The detailed clinical examination of all birds was carried out. The samples from nodular lesions were collected and fixed with 10% buffered formalin, processed for routine histopathological examination. The tissue sections were stained with haematoxylin & eosin stain for microscopic examination. The affected turkey poults were treated with combination of fresh parts of medicinal plants from ethno-botanical garden. For every 10 turkey poults, Cumin seeds (*Cuminum cyminum*) - 10 g, garlic (*Allium sativum*) - 5 pulp, black pepper (*Piper nigrum*) - 5 numbers, turmeric power (*Curcuma longa*) - 5g, leaves of *Moringa oleifera* - 30 grams, neem leaves (*Azadirachta indica*) -10 numbers and leaves of thulasi (*Ocimum sanctum*) - 30 grams. These ingredients were ground as paste and the herbal mixture was administered orally at the rate of 2g/kg body weight. For topical application, leaves of *Ocimum sanctum*, *Moringa oleifera* and *Azadirachta indica* 50 gram each, garlic cloves (*Allium sativum*) - 10 numbers, turmeric powder (*Curcuma longa*) - 10 g, seeds of *Cuminum cyminum* - 20 g and camphor (*Cinnamomum camphora*) - 5 g were mixed and ground well. The herbal mixture was heated with 100 ml of castor oil (*Ricinus communis* seed oil) and 100 ml of neem seed oil (Basheer Ahamed *et al.*, 2013) ^[4]. The freshly prepared herbal mixture was applied on pox lesions on head, face and neck of turkey poults twice a day for four days.

Results and Discussions

Out of 124 turkey poulters aged between two to three months, weighing between 1.4 to 2.3 kg, 41 turkey poulters showed droopiness, ruffled feathers, reduced appetite and body weight, fever and nodular lesions on head, face and neck (Fig.1). Few birds also showed adhesion of eyelids and laboured breathing. Six numbers of birds affected with pox lesions were died previously in the same farm two to three days after showing clinical signs. Total flock was recently purchased. Out of forty turkey poulters, 29 females and 12 males were observed. The affected turkey poulters were separated from the healthy flock. Gross appearance of the lesions were nodular, erosions and crust formation. In the present study no diphtheritic lesions in oral cavity and also no lesions observed on legs and feet. The size of the nodular lesions on head, face and neck were measuring between 3 mm to 6 mm diameter. Histopathological examination of the nodular lesions showed hyperplasia and hypertrophy of the epithelium, congestion and lymphatic infiltration in stratum spinosum and Bollinger bodies as intracytoplasmic eosinophilic inclusion bodies. The clinical signs, gross pathological and histological findings observed in the present study were in accordance with earlier researchers described in avian pox (Tripathi and Cunningham, 1984; Perelman *et al.*, 1988; Basheer Ahamed *et al.*, 2013) [1, 6, 4].

All the affected birds were administered with ethno-veterinary herbal preparations orally 2 g/ kg body weight and freshly prepared herbal mixture was also applied topically over the nodular lesions on head, face and neck twice a day (Basheer Ahamed *et al.*, 2013) [4]. All the birds were showed marked improvement in feeding on second day and the scab lesions were formed and denuded on fourth day of treatment. On sixth day, all the turkey poulters were apparently normal. Morbidity of 89.28 % and mortality of 18 % were recorded in outbreak of turkey pox by Basheer Ahamed *et al.* (2013) [4]. In the present study, the morbidity was 33.06 % and mortality was 4.83 %. Mortality is rare in cutaneous form of pox but with concurrent secondary infection and stress increase the mortality (Yoshikawa and Alam, 2002) [5]. In Ethno-Veterinary Medicine (EVM), the natural products prepared from locally available plants are generally used for the treatment or prevention of diseases (Gueye, 1997) [7]. Traditional knowledge on herbal remedies helped to control poultry diseases including pox (Muherjee and Wahil, 2006) [8]. In the present study, ethno-veterinary herbal preparations were used on the second to third day of pox lesion development. All the birds showed marked recovery on fourth day of treatment and complete denudation of scab over head, face and neck was noted on sixth day. The castor oil has been used traditionally for cure in muscle and joint problems which might be helped in the healing of pox lesions in the present study. The earlier recovery from the turkey pox could be possibly due to combination of herbal ingredients which showed synergistic and additive actions. There was no secondary complication in affected birds might be because of stress reduction due to herbal remedies. Similar finding were reported by researchers (Mohan *et al.*, 2008; Basheer Ahamed *et al.*, 2013) [9, 4]. In the present study, the early diagnosis and use of ethno-veterinary herbal medicines in turkey pox helped to have complete cure without mortality.



Fig 1: Turkey Poult showing nodular lesions over head, face and neck

4. Conclusion

Outbreak of turkey pox was reported in 41 turkey poulters. Affected birds showed nodular lesions in head, face and neck. All the birds were treated with oral and topical ethno-veterinary herbal preparations. All the turkey poulters showed complete recovery after treatment.

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