www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(7): 2494-2496

www.thepharmajournal.com
Received: 09-04-2022
Accepted: 19-05-2022

Savita Meena
Department of Animal Husbandry, VO, Regional Animal Disease Diagnostic Centre, Chetak Circle, Udaipur, Rajasthan, India

Mukesh Meena
Department of Animal Husbandry, Govt. Veterinary Polyclinic, Bundi, Rajasthan, India

Manisha Mehra
Assistant Professor, Department of Veterinary Pathology, CVAS, Bikaner, Rajasthan, India

Hemant Dadhich
Professor and Director Reasearch, CVAS, Bikaner, Rajasthan, India

Corresponding Author
Savita Meena
Department of Animal Husbandry, VO, Regional Animal Disease Diagnostic Centre, Chetak Circle, Udaipur, Rajasthan, India

Pathological and bacteriological studies of perivascular dermatitis in poultry

Savita Meena, Mukesh Meena, Manisha Mehra and Hemant Dadhich

Abstract
Occurrence and pathology of dermatitis in poultry were studied in 1386 poultry of different age, sex and breeds, out of those 304 samples were positive for different types of dermatitis. Out of 304 samples Perivascular dermatitis was recorded in 9.37% cases of dermatitis in poultry pathological changes revealed inflammatory around the dermal blood vessels. S. aureus, E. coli and Bacillus sp. organisms were isolated from samples.

Keywords: Blood vessels, dermatitis, poultry, histopathology, bacteriology

Introduction
Poultry is one of the fastest growing segments of the agricultural sector in India today. While the production of agricultural crops has been rising at a rate of 1.5 to 2 percent per annum, that of eggs and broilers has been rising at a rate of 8 to 10 percent per annum (Apeda.Gov.in 2021) [1]. This sector consists of the largest and most industrialized (more than 1.00 lakh birds) enterprises in the poultry industry (R. N. Chatterjee *et al.* 2015) [4] It can be used as a powerful tool for alleviation of rural poverty, eradication of malnutrition and creation of gainful employment in vast rural areas (Sharma and Chatterjee, 2009; Rajkumar *et al*., 2010) [10, 4].
The skin is not just the barrier between body and it's exterior but a living tissue which contribute to and reflect the state of vital physiological functions. The skin infections are caused by bacteria, viruses, parasites, fungi and other environmental factors like nutritional deficiency, allergy, burn, radiation etc. Among skin infections, dermatitis is a common problem associated with deep litter system of rearing.

Materials and Methods
The tissue Samples for proposed investigation were collected from various poultry farms of different areas of Rajasthan.
The tissue samples were collected for histopathological work in 10 per cent formalin and processed manually for paraffin embedding by acetone and benzene technique (Lillie, 1965) [7] for histopathology. Tissue section of 4-6 micron thickness were cut and stained with haematoxylin and eosin staining technique as a routine.
For bacteriology the skin swabs / samples were collected aseptically on sterile nutrient broth and culuture & identification of bacteria was done on the basis of culture and morphological characteristics as per standered method (Carter, 1984) [3].

Results
Pathological Studies
This condition was recorded in 30 (9.87 per cent) cases. Grossly, the samples showed presence of hyperaemia, black brown discolouration and necrotizing changes on the skin. (Fig.1).
Microscopically, the predominant inflammatory reaction was centered around the dermal blood vessels. There were presence of mild to moderate number of polymorphonuclears and mononuclear cells infiltration around the superficial dermal blood vessels (Fig.2). In some cases, epidermal hyperplasia and hyperkeratosis were noticed (Fig.3). Few cases revealed numerous eosinophills along with mononuclear infiltration around the blood vessels. Sometimes, mononuclear infiltration predominantly of lymphocytes were observed around the blood vessels (Fig. 4).

Bacteriological studies

The bacterial strains isolated from 20 samples for this condition were *S. aureus*, *E. coli* and *Bacillus sp.* in which *S. aureus* (fig. 5 & 6) and *E. coli* (fig. 7 & 8) were the most commonly isolated organisms.

Fig 1: Photograph showing hyperemia along with black brown discolouration of Skin

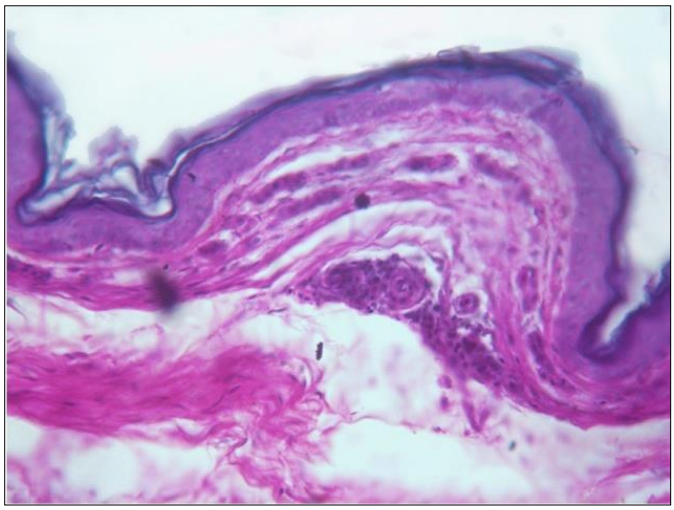

Fig 2: Photomicrograph of skin having perivascular dermatitis showing polymorphonuclear & mononuclear infiltration around the blood vessels along with hyperkeratosis. H.&E. 100X

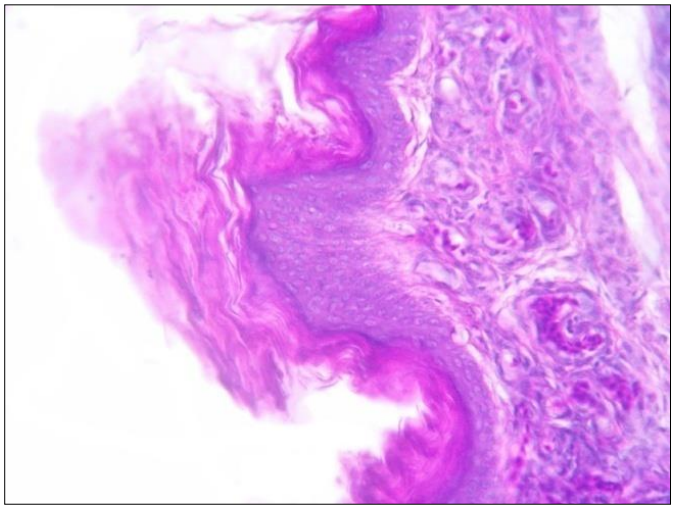

Fig 3: Photomicrograph of skin having epidermal hyperplasia and hyperkeratosis. H. & E. 400X.

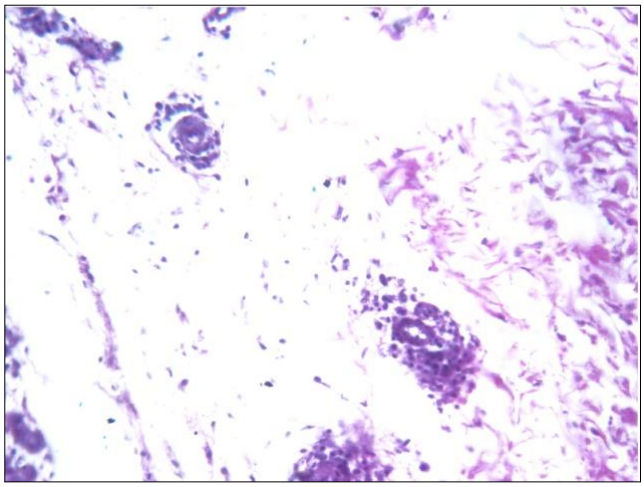

Fig 4: Photomicrograph of skin having perivascular dermatitis showing mononuclear infiltration around the blood vessels. H. & E. 400X

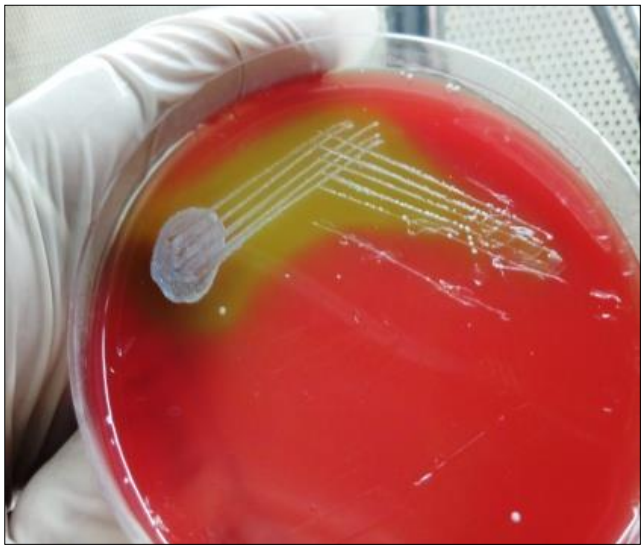

Fig 5: Photograph of Blood agar plates showing yellow coloured colonies of *Staphylococcus aureus*

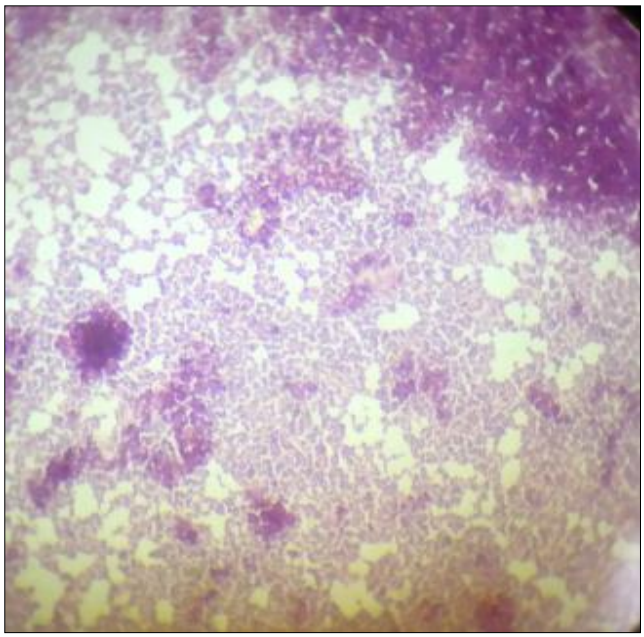

Fig 6: Photomicrograph of *Staphylococcus aureus* isolated from skin sample. Gram's staining.

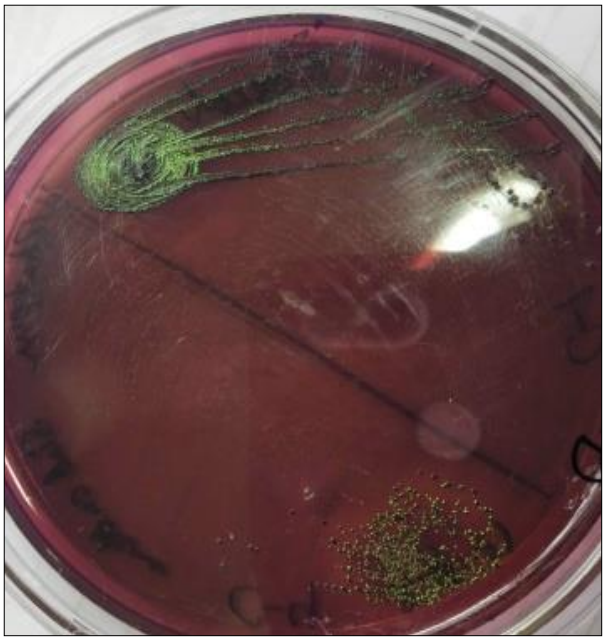

Fig 7: Photograph of Eosine Methylene Blue (EMB) agar petriplates showing metallic sheen of *Escherichia coli* bacteria.

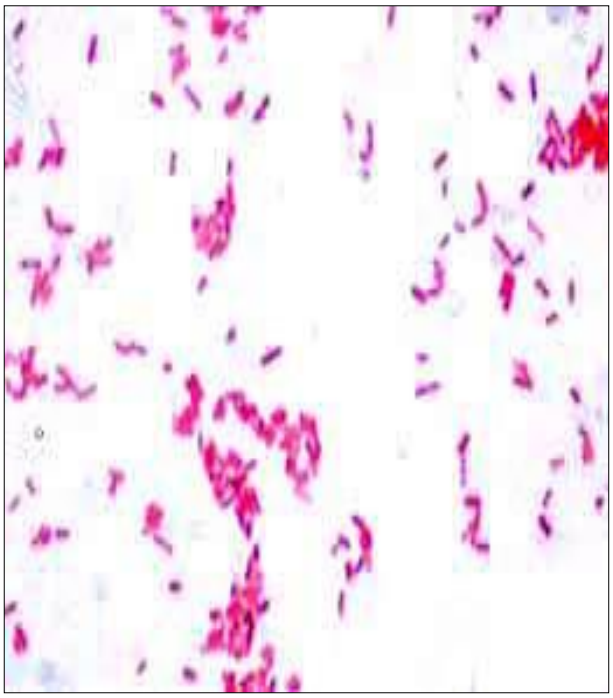

Fig 8: Photomicrograph of *E. coli* isolated from skin sample. Gram's staining.

Conclusion

Polymorphonuclear and mononuclear infiltration around dermal blood vessels were found in perivascular dermatitis.

Discussion

The gross lesion in perivascular dermatitis such as hyperaemia and necrotizing changes observed in this investigation were in agreement with Kohler *et al.* (1978) [6]. Microscopic findings such as polymorphonuclear and mononuclear cells infiltration around blood vessels along with epidermal hyperplasia and hyperkeratosis were also described by Jubb *et al.* (2007) [5] in domestic animals for this condition. Whereas while describing the perivascular dermatitis in chickens Awadhiya *et al.* (1982) [2] reported intense perivascular mononuclear infiltrations in the deep dermis. Shimizu *et al.* (1967) [11], Machado and Rangel (1943) [8] and Sinha *et al.* (1987) [12] also described perivascular lymohocytic aggregations around the dermal blood vessels in poultry. Above findings may be due to hypersensitivity reaction, infections, ectoparasitism or nutritional deficiency.

References

1. Apeda. Gov. Agricultural and processed food products export and development authority, 2021.
2. Awadhiya RP, Vegad JL, Kolte GN. Eosinophil leukocytic response in dinitrochlorobenzene skin hypersensitivity reaction in the chicken. Avian Pathology. 1982;11:187-194.
3. Carter GR. Diagnostic Procedure in Veterinary Microbiology. 2nd Ed. Charles, C. Thomas Publishers, Springfield, 1984.
4. Chatterjee RN, Rajkumar U. An Overview Of Poultry Production In India, Indian J Anim. Hlth. 2015;54(2):89-108
5. Jubb KVF, Kennedy PC, Palmer N. Pathology of Domestic Animals. 5th edn. Academic Press, Inc. London, U.K, 2007.
6. Kohler B, Bergmann V, Witte W, Heiss R, Vogel K. Staphylococcus aureus as a cause of dermatitis in broilers. Monatshefte fur Veterinarmedizin. 1978;33:22-28.
7. Lillie RD. Histopathological technique and Practical histochemistry, McGraw Hill Book co., NewYork and London, 1965.
8. Machado A, Rangel NM. Epidermal Cysts in a Hen. Bol. Soc. Brasil. Med. vet. 1943;12:9-12.
9. Rajkumar U, Rama Rao SV, Sharma RP. Backyard Poultry Farming-Changing the Face of Rural and Tribal Livelihoods. Indian Farming. 2010;59:20-24.
10. Sharma RP, Chatterjee RN. Backyard poultry farming and rural food security. Indian Farming. 2009;59:36-3.
11. Shimizu T, Horiuchi T, Shoya S, Nomura M, Shibata S. An outbreak of chicken vesicular dermatitis due to Staphylococcus epidermidis. Bull. Nat. Inst. Anim. Hlth. No. 1967;55:21-26.
12. Sinha BK, Vegad JL, Awadhiya RP. Pathology of concanavalin A-induced cutaneous reaction in the chicken. Res. Vet. Sci. 1987;42:365-72.