Small Ruminant Research 126 (2015) 28–32

Contents lists available at ScienceDirect

Small Ruminant Research

journal homepage: www.elsevier.com/locate/smallrumres

Ocular squamous cell carcinoma in Valle del Belice sheep: Histology and immunohistochemistry☆

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ARTICLE INFO

Article history:
Available online 7 February 2015

Keywords:
Sheep
Squamous cell carcinoma
Valle del Belice breed

ABSTRACT

Ocular squamous cell carcinoma (OSCC) in animals is a primary tumor of epithelial cells that may occur in different ocular and periocular tissues, especially the epithelial surfaces of the conjunctiva, corneoscleral junction, nictitating membrane, cornea and eyelid skin. This report describes histological and immunohistochemical features of four different clinical cases classified as OSCC in Valle del Belice sheep. Importance of solar radiation in the etiology of OSCC is discussed, together with other potential risk factors.

1. Introduction

Squamous cell carcinoma in sheep occurs more frequently in body areas poor of wool and pigmentation (Méndez et al., 1997). Anatomical sites like the ears, eyes, nose, and perineum are often affected (Ahmed and Hassanein, 2012). OSCC in sheep poses a lower incidence than in cattle (Priester and Mantel, 1971) even if a real figure of tumor occurrence cannot be determined with certainty because of the short productive life of sheep and goats (Goldschmidt and Hendrick, 2002). In the United States, the prevalence of OSCC varies, relating to the geographical exposition. It is higher in the Southern regions with lower latitudes, characterized by higher levels of sunlight (Heeney and Valli, 1985). In human oncology, for each 8°–10° of latitude to the equator, there is a doubling of the SCC incidence (Scotto et al., 1974). Moreover, certain breeds of cattle (Hereford) are reported for their high incidence of carcinomas, when kept in subtropical areas. OSCC has an economic impact, as it could be the cause of the whole-carcass condemnation at slaughter. Ocular squamous cell carcinomas generally have a slow development and can be formed at cornea, conjunctiva and the eyelids level. Intense exposure to the sun's ultraviolet rays can be considered a risk factor, together with presence of papillomas or chronic inflammatory lesions (Marà et al., 2005). This paper describes the pathological and histological features of OSCC, observed in four sheep reared in Sicily.

2. Case description

The sheep were referred to Laboratory of Experimental Zooprophilactic Institute of Sicily (Section of Barcellona P.G.) having a history of ocular disease, several months

☆ This paper is part of a supplement issue entitled "S.I.P.A.O.C. Congress 2012". Guest Edited by Antonello Carta, Maria Teresa Manfredi, Giuseppe Moniello and Massimo Trabalza-Marinucci.

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http://dx.doi.org/10.1016/j.smallrumres.2015.01.024
0921-4488/

Figs. 1–4. Different ocular squamous cell carcinoma degrees involving the eyelids and nictitating membrane with a partial prolapse of the whole eye in one case (Fig. 2).

in duration. All sheep were of the Valle del Belice breed, except a Pinzirita (Fig. 2) (breed genetically related close to Valle del Belice breed), from 4 to 8 years of age and reared in different regions of Sicily.

Two sheep showed lesions surrounding the eyelids and nictitating membrane (Figs. 1–3). A third animal showed lesions, mainly in the periocular structures with a partial prolapse of the whole eye (Fig. 2). An ocular mucopurulent discharge, associated with corneal ulcers, edema and neovascularisation, was also observed. In one case it appeared extensively ulcerated skin, while in the other loss of drainage had led to a severe swelling. The fourth case was constituted by a large lesion (Fig. 4), that involved the orbital region. Two animals were euthanized, because of the impossibility to treat such severe lesion by surgical operation, while two were operated, enucleating the ocular globes. The complete eyes were removed, fixed in 10% neutral buffered formalin and sent in part to the Histopathology and Immunohistochemistry Laboratory of Experimental Zooprophilactic Institute of Sicily (Palermo), and in part to the Department of Veterinary Science, University of Torino for histological investigations.

In the fourth case, a cross-section of the skull was also performed (Fig. 5), with evidence of massive neoplastic proliferation, showing large necrotic and colliquate areas. An almost complete erosion of turbinates and