Polyhydroxy acid-based topical treatment for ichthyosis in the golden retriever: histopathological findings

A. Puigdemont*, N. Furiani†, D. Fondevila*, L. Ramió-Lluch§, and P. Brazis§

*Universitat Autònoma de Barcelona, Bellaterra, Barcelona, Spain.
†Studio di Dermatologia Veterinaria, Perugia, Italy.
§Laboratorios LETI, Barcelona, Spain.

Introduction
Autosomal recessive congenital ichthyosis (ARCI) in golden retrievers has been associated with a mutated PNPLA1 gene. ARCI typically manifests as generalized scaling of skin giving rise to scales of different size and shades of white or black, mainly in the ventral and lateral region of the neck and trunk. Microscopically, the main feature of ARCI is laminar orthokeratotic hyperkeratosis with minimal to no epidermal hyperplasia and the absence of an inflammatory reaction. The presence of scattered keratinocytes containing clear intracellular spaces (vacuoles) in the outer spinous layer is also considered characteristic. Among other polyhydroxy acid, gluconolactone promotes stratum corneum acidification improving the epidermal barrier through epidermal lipid maturation and keratinocyte cohesion.

This study examines the efficacy of a gluconolactone and other α and β hydroxy acids topical treatment for the management of ichthyosis in golden retrievers.

Material and methods
Two female golden retrievers of 6 years old with clinical signs of ARCI and a PCR-confirmed mutated PNPLA1 gene, received a shampoo and a lotion containing gluconolactone and other α and β hydroxy acids (Kerato, Laboratorios LETI, Spain) twice a week for 15 days and then weekly for other 15 days. Biopsy specimens were obtained from the ventro-lateral aspect of the thorax before and 30 days after starting treatment. Reductions in the extent and size of the scales were assessed by the veterinary dermatologist on days 15 and 30 in comparison to day 0. Improvements were expressed as percentage.

Results
Before treatment, histological findings revealed a compact orthokeratotic hyperkeratosis and multilocal pigmentation. On day 30 orthokeratotic hyperkeratosis was reduced, keratin was re-organized as a laminated basket weave mesh and pigmentation decreased. However, as expected, vacuolated cells were still present in the examined samples (Fig. 1). At days 15 and 30, the topical treatment had significantly reduced the presence of the scales by 60% and 90%, respectively (Fig. 2).

Conclusion
A topical treatment with gluconolactone and α, β hydroxy acids improved the condition of the stratum corneum and reduced the number of scales in golden retrievers with ARCI after 30 days of treatment.

Figure 1. Skin biopsies before treatment (a, c) with diffuse laminar orthokeratotic hyperkeratosis in the stratum corneum and scattered vacuolated keratinocytes in the stratum granulosum and spinosum. After 30 days of topical treatment, keratin recovers its typical basket weave appearance (b, d). Haematoxylin and eosin.

Figure 2. Clinical response. Pictures obtained before (a, d), after 15 days (b,e) and 1 month of treatment (c, f).

Bibliography: