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Evaluations of transepidermal water loss, stratum corneum hydration, surface pH for anesthetic and non-anesthetic states in anatomical locations of dogs

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Introduction: Evalutions of TEWL, SC hydration and skin pH were used for assessment of the skin barrier function in dermatologic research. This study was conducted to evaluate TEWL, skin hydration and skin pH measurements in the 14 anatomical locations of the beagle dog. Thus, the aims of this study were (i) to investigate skin barrier function parameter in normal state (non-anesthetic) at fourteen different body sites in healthy beagle dog, and (ii) to compare skin barrier change patterns between non-anesthetic and anesthetic state at fourteen different body sites in healthy beagle dog to detect real differences in anesthesia.

Materials and Methods: TEWL was measured with an evaporimeter (VapoMeter, SWL2g; Delfin Technologies Ltd, Kuopio, Finland). Skin pH and skin hydraiton were measured using skin pH meter pH900 and corneometer CM 825®(Courage+Khazaka Electronic GmbH, Köln, Germany). All readings were taken from five beagle from the 14 body sites. We performed to evaluation of TEWL, skin pH, skin hydration on 14 anatomical locations before and after anesthesia (Xylazine HCl and Ketamine HCl). Statistical analyses were conducted by one-way ANOVA (SPSS 12.0 Analytical Software) for between 14 anatomical location interactions to evaluate anatomical location effect, and by paired *t*-test (SAS) for between non-anesthetic and anesthetic state of each location to evaluate physiological barrier change after anesthesia.

Results: A one-way ANOVA model with TEWL, SC hydration and skin pH as dependent variables were analyzed that resulted in a statistically significant difference of anatomical location effect for each measurements at non-anesthetic and anesthetic state. A paired t-test model with TEWL, SC hydration and skin pH as dependent variables was analyzed that resulted in a statistically significant difference between non-anesthetic and anesthetic state at fourteen different body sites for each measurements at each time points.

Discussion & Clinical relevance: The different anatomical characters are likely to be related to structural and physiological differences. Therefore, the anatomical character of skin should be considered in management of anatomical specific skin disorders and in assessment of skin barrier function and other various experiments related to skin in the dog. It is concluded that the measurements of TEWL, SC hydraton and skin pH can be a very useful source of information in helping to identify differences of skin barrier function.

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