INVESTIGATION INTO THE ETIOLOGY OF "HAIRLESS" (ALOPECIC) RINGED SEALS (*Phoca hispida*) IN THE BERING SEA

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Abstract

During the last several years, Alaskan native subsistence hunters have reported "hairless" ringed seals (*Phoca hispida*) taken along the Alaska Bering Sea coast. Pathologic findings of four cases of a patchy alopecia syndrome are presented. Case 1 was diagnosed as a possible endocrine disorder based on histopathology of a previously frozen carcass from the native subsistence harvest. Case 2 examined skin samples from a subsistence-harvested seal. On histopathology, the hair follicles appeared to be in an inactive state consistent with a non-molting animal. Additionally, there was a bacterial folliculitis at the intersection of haired versus unhaired skin. An unusual lesion was observed in both cases 3 (a subsistence-harvested seal) and case 4 (a live-captured juvenile seal). In both animals, organisms that destroyed the shaft, most likely resulting in shaft breakage, colonized hair shafts within and around the affected areas. The lesions were accompanied by a moderate folliculitis and perifollicular dermatitis. Dermatophytes are the most common organisms to specifically colonize hair, although dermatophyte colonies usually have a different appearance than the organisms observed in cases 3 and 4. *Trichophyton shoenleini* and an unidentified fungus were cultured from case 3 and a possible *Madurella grisa* was isolated from case 4. The animal representing case 4 was encountered during live-capture/release studies in Bristol Bay. This animal was transported to a rehabilitation center and treated for fungal dermatitis with oral itraconazole and topical povidone iodine applications. After 6 wk of treatment, a repeat biopsy demonstrated marked reduction in the skin inflammation, consistent with a positive treatment response. Serum chemistry values were within expected ranges throughout the rehabilitation period, but complete blood cell counts indicated a mild eosinophilia during the first 4 wk of treatment. Thyroid hormone levels were lower than similarly aged phocids but reached an acceptable range prior to release. Challenges with thyroid-stimulating hormone (TSH) and adrenocorticotropic hormone (ACTH) were performed to further assess endocrine responses. Serum retinol and trace minerals concentrations were measured and found to be higher than published values for similar species, but as with thyroid hormones, no reference ranges for ringed seals were available. Organochlorine contaminant concentrations in blubber from two cases (1 and 4) were lower than sympatric pinnipeds examined by the same laboratory. Electron microscopy of the hair shafts on select cases was not enlightening.

This occurrence of alopecia is of particular interest because it may be an emerging problem and could indicate either the introduction of a new organism, increased susceptibility to an endemic organism, or the possible range extension of an uncharacterized organism due to an environmental change. Additionally, there are important subsistence food implications including the public health concerns for native people who handle and consume these animals, the potential for wastage due to carcass rejection for human consumption, and a damaged pelt not utilizable for clothing or crafts.