

Therapeutic Management of Hypovitaminosis-A in a Turtle

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Abstract

A red ear slider turtle of one year old was presented to the Veterinary Clinical Complex (VCC), College of Veterinary Science, Rajendranagar, Hyderabad with a history of swollen and oedematous eyelids, anorexia, lethargy and stunted growth, that was being provided with commercial feed. Clinical examination of the turtle revealed conjunctivitis along with blepharitis and blepharedema. The case was tentatively diagnosed as Hypovitaminosis-A and treated with injectable vitamin-A, oral Vetrivit turtle multivitamin and turtle eye drops, and complete recovery of the turtle was noticed after a period of 30 days.

Keywords: Blepharitis, Blepharedema, Hypovitaminosis-A, Turtle.

Introduction

Vitamin A is essential for the maintenance and production of epithelial cells and is also intimately related to vision. The clinical condition of Hypovitaminosis-A in reptiles results from a low β -carotene diet (Chitty and Raftery, 2013). In turtles, yolk sac is not fully resorbed until the age of six months and satisfies the Vitamin-A requirements of hatchlings until resorption. Chelonians predominately feed on foods low in Vitamin-A, such as iceberg lettuce, cucumbers or meat products. Dark leafy greens like spinach, turnip, mustard greens, broccoli, yellow or orange fruits and vegetables such as squash, peppers and carrots are rich in β -carotene which acts as a precursor of Vitamin A (Mitchell and Tully, 2009). Herbivores are efficient in converting beta carotene to Vitamin A whereas carnivores and many aquatic turtles and box turtles (*Terrapene spp.*) are less capable of converting beta carotene to Vitamin A making them more susceptible to deficiency. Inappropriate diet and husbandry practices are the risk factors to cause Hypovitaminosis-A in chelonians (Mayer and Donnelly, 2013). The most common clinical abnormality associated with Hypovitaminosis-A is squamous metaplasia, resulting in degeneration of epithelial surfaces such as conjunctiva, gingiva,

pancreatic ducts, renal tubules, skin and lung alveoli. Squamous metaplasia can manifest itself in several different ways because of multiple epithelial body surfaces (Holladay *et al.*, 2001). Blepharospasm, blepharedema, blepharitis, conjunctivitis, blindness, rhinitis, lower respiratory tract disease including nasal discharge, depression, dyspnoea, open-mouth breathing and cutaneous abnormalities may be observed. Acute deficiency in semi-aquatic chelonians generally presents as ocular changes, whereas chronic deficiency in terrestrial chelonians is typically associated with respiratory, hepatic, renal and pancreatic epithelial abnormalities (Mitchell and Tully, 2009). Affected turtles should be provided with proper treatment with parenteral or oral Vitamin-A. Initiate Vitamin-A therapy for aquatic turtles @ 200-300 IU/ kg body weight, and in box turtles @ 1000-2000 IU/kg body weight, weekly once for 4-6 total doses. Change the diet to provide more preformed Vitamin-A and β -carotene for herbivorous reptiles (Mcarthur *et al.*, 2004). General recommendations for domestic species that can provide a starting point for dietary supplementation are 2.5-15 IU/gram diet on dry matter basis.

History and Clinical Observations

A one-year-old red ear slider turtle was presented to the Veterinary Clinical Complex, College of Veterinary Science, Rajendranagar, Hyderabad with a history of swollen and oedematous eyelids, loss of appetite and weight, dullness and poor growth, that was on commercial feed. On clinical examination, conjunctivitis along with blepharitis and blepharedema was evident (Fig. 1 and 2).

Diagnosis and Treatment

Based on history and clinical examination, the turtle was tentatively diagnosed as a case of hypovitaminosis-A. Treatment with Inj. Vitamin A @ 1000 IU, subcutaneously weekly once for two consecutive administrations, Vetrivit turtle multivitamin @ 6 drops twice a day per orally for 1 month and turtle eye drops were instilled @ 1 drop twice a day in both eyes. After 14 days of treatment, the turtle showed clinical improvement *i.e.*, swelling and edema of the eyelids had subsided, but complete recovery was noticed only after 30 days of therapy (Fig. 3 to 4).



Fig.1 and 2: Blepharitis and Blepharedema in turtle before treatment



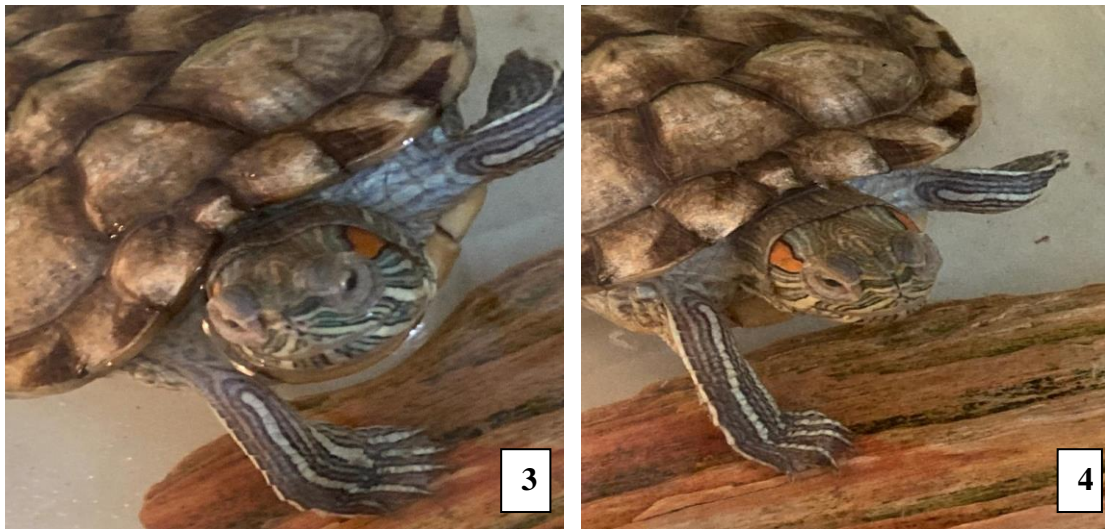


Fig. 3 and 4: Clinical improvement of turtle after treatment

Discussion

In our case, the turtle was being fed with commercial feed which is a poor source of Vitamin A. Mitchell and Tully (2009), reported hypovitaminosis-A as a clinical condition of reptiles resulting from a diet low or lacking in beta carotene and preformed Vitamin A in carnivores and omnivores reptiles. Multivitamin supplements utilized often lack preformed Vitamin-A. Herbivores can efficiently convert beta carotene to Vitamin A whereas carnivores and many turtles and box turtles are less efficient in doing so (Mayer and Donnelly, 2013). In the current case, clinical signs of conjunctivitis along with blepharitis and blepharedema were in accordance with the observations of Mitchell and Tully (2009) who noticed similar clinical signs such as unilateral or bilateral palpebral oedema, blepharitis and conjunctivitis with reduced or loss of vision in turtles suffering from hypovitaminosis A. Chronic blepharedema cases may show bilateral or unilateral white to yellow semi-solid or solid cellular debris filling the conjunctival sac. Post-hibernation blindness in tortoises is mostly due to retinal damage from Vitamin A deficiency. Hypovitaminosis A can be diagnosed from dietary history, clinical signs, measuring Vitamin A levels or histopathology of tissue samples showing squamous metaplasia of epithelial surfaces. Deficiency of Vitamin A can be corrected by oral supplementation with Vitamin A or by offering small amounts of liver once per week (Mukti, 2020). Injectable Vitamin A should be used very cautiously, as a single injection can cause hypervitaminosis A. Oral dosing with natural sources of β -carotene or preformed Vitamin A is a safe and preferred method of supplementation. Mitchell and Tully (2009) found that 1500-2000 IU Vitamin A is a safe parenteral dose for treating deficient animals. Oral dosing may be safer than parenteral treatment in avoiding vitamin A intoxication. Single parenteral injection followed by dietary correction and oral supplementation as recommended by Varshney *et al.* (2016). The current case was treated with Inj. Vitamin A @ 1000 IU, subcutaneously, weekly once for two consecutive



administrations and simultaneous oral supplementation of Vitamin A. Recommended dietary supplementation for domestic species of turtle's ranges between 2.5-15 IU/gram diet on a dry matter basis. Vetrivit turtle multivitamin is a balanced supplement to meet the vitamin requirements for turtles and terrapins. It contains a vitamin complex in a micro-emulsion form which keeps all vitamins water stable. It fights off vitamin deficiency and encourages healthy growth. Emulsified or oil-based forms have a greater ability to be stored by the reptile liver and are likely a better choice for acute treatment. Hypovitaminosis A can be prevented in herbivorous and omnivorous reptile species by including foods with high beta carotene levels such as dark green leafy vegetables, oranges, sweet potatoes, carrots, squash, melon and papaya etc. (Mayer and Donnelly, 2013).

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