Nyctotherus sp. infection in pet turtle: a case report

Ajay S. Satbige¹ · Vivek R. Kasaralika¹ · S. C. Halmandge¹ · C. Rajendran²

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Abstract The present clinical case represents the successful therapeutic management of *Nyctotherus* sp. protozoan infection in turtles. Two pet turtles were presented with history of diarrhea, dehydration, weight loss and passage of undigested food in the faeces. Direct faecal examination and Giemsa staining revealed the presence of cysts of *Nyctotherus* sp. Treatment was initiated with antiprotozoal drug, Metronidazole at the rate of 25 mg/kg body weight per-oral consecutively for 5 days, and Vimeral suspension at rate of 10–20 mg/kg per-oral for 8 days. After 10 days of intensive care and management with antiprotozoal drug, multivitamin under proper sanitary measures, the case showed gradual improvement in condition. During medication, the fecal samples were checked on every alternative day for the presence of ciliated trophozoites of *Nyctotherus* sp. After 4th day, there was no trophozoites observed by both the techniques examined and the animal was quite healthy and active and started taking food. Improvement was noticed with resumption of normal appetite. Incessant patient monitoring and initiation of suitable need based therapeutic strategy is most important in management and control of *Nyctotherus* sp. infection.

Keywords *Nyctotherus* sp. · Direct faecal examination · Giemsa staining · Turtle

Introduction

Gastrointestinal parasites are commonly found in the feces of both wild and captive tortoises (Wilkinson 2004). In most cases, they appear to cause their hosts little or no distress. However, in a confined, captive environments, the tortoises may undergo stress and get immunosuppressed, especially if overcrowded and also due to a variety of reasons such as dietary mismanagement and unsanitary condition. In such cases, the parasites can multiply rapidly if they do not require an intermediate host to complete their life cycle (Schneller and Pantchev 2008). A number of species of protozoa (*Balantidium* and *Nyctotherus* sp.) have been detected in chelonian faecal samples and these organisms are mostly non-pathogenic (Keymer 1978). But under captive conditions, they are associated with disease conditions with high protozoal burdens (Scullion and Scullion 2009). *Balantidium* and *Nyctotherus* sp. are the most common gastrointestinal commensals of turtles and aid in digestion of cellulose (Frye 1991). A higher number may be detected when the gastrointestinal disturbance occurs and cause colitis (Bone 1992) but with many other protozoa, it is not clear whether *Nyctotherus* is the sole contributor for the intestinal disorder. *Balantidium* has been associated with liver abscesses in heavily infected tortoises (Schneller and Pantchev 2008). Both are transmitted through infective cyst stages. The symptoms of the disease may range from acute diarrhoea, resulting in dehydration and weight loss to chronic cases with a complete loss of normal digestive-tract flora and inanition as a result of an inability to digest and metabolise the food. The

✉ Ajay S. Satbige
dr.ajaysatbige@gmail.com

C. Rajendran
chellairajendran1@gmail.com

¹ Department of Veterinary Medicine, Veterinary College, KVAFSU, Nandinagar, Bidar, Karnataka 585401, India

² Defence Food Research Laboratory, Defence Research and Development Organisation (DRDO), Siddharthanagar, Mysore, Karnataka 570011, India

present clinical case of two Indian flap shell turtles (*Lissemys punctata*) were presented to Out Patient Clinics of Department of Veterinary Medicine, Veterinary College, Bidar (Karnataka State) with a history of diarrhea, dehydration, weight loss and passage of undigested food. This paper deals about the diagnosis of *Nyctotherus* sp. and its clinical management of the pet tortoise.

Materials and methods

Indian flap shell turtles (*Lissemys punctata*) are harboured as a pet and recreational species in the owners' backyard and two of them were brought to Out-Patient Clinics, Department of Veterinary Medicine, Veterinary College, Bidar in the year June 2015. It had severe diarrhoea and gastrointestinal disorders and ill and did not take food for couple of days after falling ill. The freshly passed faecal samples were collected for the diagnosis of the causative agents. The collected faecal matter was subjected to microscopy with the following two different techniques. For direct smear faecal examination, a drop of saline was deposited on the clean microscopic slide and then a speck of faecal matter was added and mixed thoroughly. A cover slip was applied and the preparation was examined under compound microscope initially with 10X objective followed with 40X objectives. For Giemsa staining, a small quantity of faecal sample was spread on a clean microscopic slide, air dried and fixed with methanol. The smear was stained with a fresh solution of 10 % Giemsa in clean water for 30 min, rinsed off in tap water for examination under microscope.

Results and discussion

Two pet turtle was presented to Out Patient Clinics of Department of Veterinary Medicine, Veterinary College, Bidar with a history of diarrhoea, dehydration, weight loss and passage of undigested food for 2 days. Based on the symptoms, the faecal smear and the smear stained as per the Giemsa staining were examined under 400 (10 × 40X) magnification could able to detect the stage of trophozoites of *Nyctotherus* sp. which were observed in a colonised form rather than the individual, but both direct and giemsa staining detection method could not find any cyst in this examinations (Figs. 1, 2). Ciliates are characterized by the presence of numerous short cilia spread over the body of the organism. The measurement of the organism is 93.45–112 µm in length and 46.8–79.89 µm in width. The outer coverings are covered with ciliates all over the body *Nyctotherus* sp. is a large, lemon-like shaped, slow moving organism. Fresh

Fig. 1 Showing the ciliated trophozoite stage of *Nyctotherus* sp. from the fecal smear examined under 400 magnifications in a compound microscope

Fig. 2 Showing the ciliated trophozoite stage of *Nyctotherus* sp. from the fecal smear stained with Giemsa staining under 100 magnification in a compound microscope

samples are the best one to detect protozoa, which may be inactive in older samples. The *Balantidium* trophozoite may be identified by its ciliate appearance and oval whereas the cysts are round. *Nyctotherus* trophozoites

are larger but their cysts are ovoid, operculated and a similar size to the trophozoites (Barnard and Upton 1994). The infectious stages such as cysts and trophozoites can be found in the intestines. According to a scientific document reported by Bosschere and Roels (2015) the ingested infective cyst travelled to small intestine and produces trophozoites which are colonise in the large intestine where they replicate and also form new infective cysts.

After diagnosis, the treatment was initiated with antiprotozoal drug, metronidazole at the rate of 25 mg/kg body weight per oral consecutively for 5 days along with Vimeral suspension (multivitamin supplement) at rate of 10–20 mg/kg body weight per oral for 8 days. After 10 days of intensive care and management with antiprotozoal drug, multivitamin and proper sanitary environment was established around the turtles made gradual improvement in clinical condition. During the medication period, the faecal samples were collected every alternate day for the presence of the cyst of *Nyctotherus* sp. The examination of the faecal samples showed there were no ciliated trophozoites or cyst observed by direct faecal examination as well as Giemsa staining method and the animal was quite healthy and active, started taking food after 4th day. Improvement was noticed with resumption of normal appetite. Incessant patient monitoring and initiation of suitable need based therapeutic strategy is most important in management and control of cyst infection. Similar findings were made by earlier report in *Geochelone carbonaria* and *G. elegans* imported into the USA (Ernst and Nichols 1974). The present study reports that the *Nyctotherus* spp. is observed in Indian Flap-shell pet turtles (*Lissemys punctata*).

Conclusion

The clinical conditions of gastrointestinal disorder caused by protozoa, *Nyctotherus* sp. is brought under control by the drug Metronidazole. Protozoa organisms can represent a major hazard to captive collections of Chelonia but not all occurrences are pathogenic. The best way to prevent this infection is the maintenance of good hygiene. A special attention should also be paid to food handling. Cleaning and disinfection of husbandry infrastructure is highly recommended on a regular basis.

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