Successful management of ivermectin toxicity in a Persian cat

Shabnam Sidhu[1], Asmita Narang, Kirti Dua and Neetu Saini
Department of Veterinary Medicine, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, India

Abstract

Over the counter availability of many drugs in developing countries like India can lead to drug abuse and cases of toxicity in veterinary practice. A 3-month old male Persian kitten weighing 1 kg was presented to the Small Animal Clinics, Teaching Veterinary Hospital, Guru Angad Dev Veterinary & Animal Sciences University with history of ataxia, sudden recumbency, loss of vision along with accidental feeding of off-label oral ivermectin preparation @ 2.5 mg/kg. On presentation,it was dull and laterally recumbent. Physical examination revealed dilated pupils, absence of menace response and decreased PLR. The kitten was treated with 0.9% NSS @ 30 ml/kg/day. The kitten responded well with improvement in clinical signs on day 1 itself. On 3rd day of presentation the kitten returned to normal mentation, was playful and responsive to external stimulus. Till the last follow up (one week later) kitten was completely healthy and was normally doing its day to day activities. This report describes a case of ivermectin toxicosis in a Persian kitten that was safely and successfully treated using isotonic crystalloid solution.

Ivermectin is a macrocyclic lactone that is commonly used in veterinary practice (small and large animals). Avermectins (eg, abamectin, ivermectin, eprinomectin, doramectin, and selamectin) are widely used as they have excellent efficacy for the treatment of external and internal parasites (Ghubash, 2006). In mammals, these drugs have a wide margin of safety when the blood-brain barrier is intact or when an appropriate dose is used (Merola and Eubig, 2012). The target of its antiparasitic action is an ivermectin-sensitive glutamate gated Cl– channel receptor (GluCLR) that exists only in a number of invertebrates and the GABA receptor (Muhammad *et al.,*2004).

Ivermectin intoxication is quite well documented in dogs (Merola*et al.,*2009) and only a few reports of ivermectin intoxication in cats have been reported (Pritchard, 2010; Kidwell *et al.,*2014; Jourdan *et al.,*2015). Ivermectin toxicity can occur when excessive doses are administered (>500 µg/kg in cats) (Burrows, 2009). Over-the-counter availability of drugs in developing countries like India poses the risk of their abuse and overdosing in animals by the owners.

Signs of toxicity mainly involve the central nervous system and include mydriasis, blindness, depression, ataxia, weakness, tremors, abnormal gait, recumbency, coma and even death (Gonzalez *et al.,*2009; Jourdan *et al.,*2015).

Due to the lack of a specific antidote, symptomatictreatment and fluid therapy are usually the only recommendations for the management of ivermectin toxicosis (Lovell, 1990). Different researchers have tried various treatment protocols for ivermectin toxicity in cats with variable success. Muhammad *et al.* (2004) tried Neostigmine methyl sulfate (25 µg) and 5% dextrose (20 ml) I/Vin a kitten massively overdosed with ivermectin, it showed a transient improvement but died 12 hours post treatment. Intravenous lipid emulsion (IVLE) bolus @ 1.5 mg/kg is considered in the management of ivermectin toxicosis (Jourdan *et al.,*2015). Kidwell *et al.*(2014) recommended use of balanced isotonic crystalloid solution at a rate of 6 ml/hr (36 ml/kg/day) and use of intravenous lipid emulsion thereafter if no improvement is seen with the initial treatment. Successful management of ivermectin toxicity in a Persian cat is reported.

Case History

A 3-month old male Persian kitten weighing 1 kg was presented to the Small Animal Clinics, Teaching Veterinary Hospital, Guru Angad Dev Veterinary and Animal Sciences University with history of ataxia, sudden recumbency and loss of vision. Upon questioning the owner about any changes in feed or accidental ingestion of some chemical, the owner declared about the use of off-label oral ivermectin preparation @ 2.5 mg/kg total dose (5 times the recommended dose) once only. According to the owner after 6 hours of ivermectin administration, the kitten showed signs of ataxia and recumbency. On presentation the cat was

[1]Corresponding author: Email: vetsidhu@gmail.com

dull, laterally recumbent and was unable to rise and walk. It was normothermic (RT-102˚F), tachycardiac (HR-140 bpm) and had deep respiratory efforts (but with a normal respiration rate). Clinical examination revealed absence of menace response, dilated pupils and decreased pupillary light reflex (PLR) to ambient light. On the day of presentation a 24 G IV catheter was immediately placed in the cephalic vein and isotonic crystalloid solution (0.9% normal saline solution) was administered @ 30 ml/kg/day(Kitwell *et al.,* 2014). Next day on re-evaluation, the kitten was normothermic with RT-101.6 ˚F), heart rate 110 bpm and normal respiration rate. According to the owner animal was walking normally and also taking food. Clinical examination showed mild ataxia (less than the previous day). However, the menace response was present along with positive PLR. As there was significant improvement in the clinical signs, parenteral administration of isotonic crystalloid solution (0.9% NSS) was continued @ 30 ml/kg/day with no change in treatment for two days. By the time this treatment finished the kitten was observed to be very active with normal body stance and gait and was also able to maintain a normal "curled up" position while sleeping. The owner was advised follow up after one day. On the third day of presentation the kitten was completely normal, playful and active, responsive to external stimulus and no more complaints of ataxia or blindness. On a telephonic conversation with the owner, a week after the treatment, it was reported that the kitten was completely healthy and doing its day to day activities.

Discussion

The recommended dose of ivermectin in cats is less than 500 µg/kg (Burrows, 2009).Pritchard (2010) reported generalized tremors in a 12 year old short hair cat due to accidental application of a spot-on preparation by the owner. Meekins (2015) reported ivermectin intoxication in five cats with aural administration of a dose of an ivermectin paste intended for oral administration to horses (approx 22mg/cat). Overdose of ivermectin via subcutaneous route @ 4 mg/kg in twenty adult cats causing neurological signs was reported by Jourdan *et al.* (2015).

The kitten presented to us showed classic signs of ivermectin toxicity. Similar clinical findings were also reported by Pritchard (2010) and Kitwell *et al.*(2014). Due to lack of specific antidotes, fluid therapy is usually recommended for the treatment of ivermectin toxicity (Lovell, 1990). Kitwell *et al.*(2014) recommended use of isotonic crystalloid solution (0.9% normal saline solution) @ 30 ml/kg/day for the management of ivermectin toxicity in cats. Administration of intravenous lipid emulsion (IVLE) is recommended if there is no improvement with initial treatment with isotonic crystalloid solution (Jourdan *et al.,* 2015). However, in our case as there was improvement with initial administration of isotonic crystalloids, no other treatment was attempted as it was not required.

References

Burrows, A. 2009. Avermectins in dermatology. In: Kirk RW. ed. Kirk's Current Veterinary Therapy XIV. St. Louis: Saunders Elsevier; pp. 390–394.

Ghubash, R. 2006. Parasitic miticidal therapy. *Clin Tech Small Anim Pract*.:21(3):135–144.

Gonzalez, C. A., Sahagun, A.M., Jose L. M., Martinez, N. F. Vega, M.S. and Vieitez, J.J.2009.The pharmacokinetics and metabolism of ivermectin in domestic animal species.*Vet J*.:179(1):25–37.

Jourdan, G., Boyer, G., Raymond-Letron, I., Bouhsira, E., Bedel, B. and Verwaerde, P. 2015. Intravenous lipid emulsion therapy in 20 cats accidentally overdosed with ivermectin. *J Vet Emerg Crit Care*.:25(5): 667–671.

Kidwell, J.H., Buckley, G.J., Allen,A.E. and Bandt, C.2014. Use of IV lipid emulsion for treatment of ivermectintoxicosis in a cat. *J Am Anim Hosp Assoc*.:50(1):59–61.

Lovell, R. 1990. Ivermectin and piperazinetoxicoses in dogs and cats.*Vet Clin North Am Small Anim Pract*.:20(2):453–468.

Meekins, J.M., Guess, S.C.and Rankin, A.J. 2015. Retinopathy associated with ivermectin toxicosis in five cats. *J Am Vet Med Assoc*.:246(11):1238-41.

Merola, V. M. and Eubig, P.A. 2012.Toxicology of avermectins and milbemycins (macrocyclic lactones) and the role of P-glycoprotein in dogs and cats. *Vet Clin Small Anim*.:42(2):313–333.

Merola, V., Khan, S. and Gwaltney-Brant, S. 2009. Ivermectin toxicosis in dogs: a retrospective study. *J Am Anim Hosp Assoc*.:45(3):106–111.

Pritchard, J. 2010. Treating ivermectin toxicity in cats. *Vet Rec*.:166(24):766.

Received : 19.05.2019
Accepted : 24.06.2019