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Heat Stroke in Dogs and its management – A report of Two cases

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ABSTRACT

Amongst the companion animals, occurrence of heat stroke has been a commonly encountered ailment, especially during spontaneous exposure to high fluctuation in ambient temperature during summer. Two heat stroke affected adult dogs aged 10 and 3 years respectively were presented with clinical history of abruptly developing unforeseen clinical signs *viz.* exceptionally higher temperature (103.5 and 110^{0}F), tachycardia, excessively short by quick breathing, drooling of saliva, dilated pupil and hypermic eyes. Predisposing factors, breed susceptibility have been discussed. Treatment includes intravenous supplementation of Normal saline,Vitamin B_1, antibiotics and steroids.

KEYWORDS: Brachycephalic breed; comatose condition; heat stroke; mesaticephalic breed.

Introduction

Heat stroke is an adverse condition consequential to an elevated environmental temperature along with inadequate ventilation and fluid intake. Young and/or aged animals are relatively more susceptible to heat stroke (Aiello and Mays, 1998). The sex wise susceptibility of the heat stroke in dog in under reported in the literature. In dogs, the body temperature remains in between 103-110^{0}F indicates heat stress, such as confinement of the animals in limited space. The symptoms commonly observed in heat stress includes panting, salivation and hypermic mucus membrane and even chances of irreversible damage to the vital organs and impaired blood clotting. The condition may further aggravate from general weakness to comatose indicating injury to the brain damage and often followed via rigor (Kirk and Bistner, 1985).

History and Clinical Observations

Case 1: A male dog aged 10 years was brought in comatose state. Its body temperature was more than 110^{0}F. Clinical examination of the animal revealed cyanotic tongue, tachycardia, panting, drooling of saliva with dilated pupils. Auscultation of the lung and heart revealed hoarse sound. It was kept in air conditioner before being exposed to high environmental temperature of about 42^{o}C during evening exercise. Hardly the dog covered one km, started having labored breathing and could not move forward. It was rushed to the clinics immediately.

Case 2: A female Labrador aged 3 years was presented with history of anorexia for last 24 hours. The animal was dull and panting. Owner added that it is of the habit of going for clearance of the bowel at around 2 pm. It was habituated of air conditioner. The rectal temperature of the dog was 103.5^{o}F, heart rate revealed tachycardia, the pupil size was not dilated and normal coloured mucous membrane. The environmental temperature during day time in Jaipur was around 43^{o}C when the case was presented.

Treatment

In Case-1, ice packs were kept over the body of the dog, efforts were made to bring down the body temperature of the dog to normal. Ice cold water was inserted through the rectum. After giving ice packs over the whole body for 30 minutes there was decrease of the body temperature to 106.4^{o}F. But it was followed by a slight increase in temperature *i.e.* 107.2^{o}F. This was followed by speed fall of body temperature to 103.4^{o}F within 10 minutes of time. Normal saline was administered once the body temperature came within normal limit. Administration of Dexona[a] (0.5

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ml, IV), Vitamin B_1 (1 ml,IV) and Paracetamol (2 ml, IM) was done. The dog remained in comatose position and was not responding to external stimuli. The body temperature came to around 98.5°F within 5 minutes following intravenous administration of normal saline. Frequent stiffness of the limbs was seen followed by relaxation. The dog was kept under observation for four hours and it tried to drag itself after two hours. The dog was also expelling watery intestinal content whenever it was trying hard to breath. The owner reported death of the animal next day.

In Case-2 administration of Normal saline (500 ml,IV), Melonex[b] (1 ml,SC) and Dexona[a] (0.5 ml, IM) along with Floxidin[c] (1 ml, IM) was done. After 24 hours, the rectal temperature of the animal was found to be 102°F and the animal was found to be physically active. Belamyl[a] (1 ml, IM) was administered to restore the appetite of the animal. The antibiotic was continued to three days.

Discussion

Rectal temperature and prognosis : The rectal temperature of the first case was 110°F or more. Whenever the animal pant excessively it leads to increased expulsion of CO_2 from the body leading to respiratory alkalosis (Kirk and Bistner, 1985). The condition is aggravated by cerebral edema caused due to abnormalities of the blood and tissue pH as the change in pH is could not buffered by blood or plasma (Cunningham, 2007). The prognosis of dogs with such high temperature is usually grave. One important sign a clinician should look in to is the pupil size in comatose patient. If pupil are dilated and wide open and the animal is non responsive to the external stimuli, it may indicate damage to the brain. Some times the pupil size remains uneven on either side of the face in brain injury (Alexander, 1985). This may be attributed to the unresponsiveness of the cranial nerves supplying to iris. Rigidity of the extensor muscle is another indication of brain injury. In this case there was incident of rigidity of the all four limbs followed by relaxation. In the second case, the rectal temperature was found to be less than 105°F and the prognosis was good. Hence it can be derived that the prognosis of the animal is grave whenever the rectal temperature exceeds 105°F. Further study is required to establish this correlation.

Breed of dogs: Incidence of heat stroke in brachycephalic breeds (Bull dog, Pug) is comparatively more. As the skull is relatively broad and short they get less surface area for proper exchange of heat. Incidence of heat stroke in mesaticephalic breeds (Dalmatian, Labrador and Doberman) was found to be less aggressive of the skull.

Management of dogs: Incidence of heat stroke can be minimised by managemental aspects. The owner should keep in mind the abrupt change of environmental temperature leading to heat stress. Hence, animal maintained in AC, should be allowed to acclimatize with the increased temperature. Exercise to the animal should be preferably given in the early morning or late evening. It should have *ad libitum* access of water along with essential electrolytes. The animal should never be left in cars along with the glass panes up in day time. As the animal will pant more for cooling it body, the air inside the car will be saturated with the water vapour. In such cases the animals becomes more susceptible to heat stress (Cunningham and Klein, 2007).

Treatment

During heat stress, if comatose condition arises, administration of Mannitol is indicated, which helps in extraction of the intracellular fluid to the extra cellular space and expelling out from the body in form of urine. This helps in reducing the cerebrospinal fluid pressure and in return prevents further damage to the central nervous tissues. Administration of the corticosteroid is indicated to prevent damage of brain (Kirk and Bistner, 1985).

a - Brand of Zydus Animal Health, Ahmedabad
b - Brand of Intas Animal Health, Ahmedabad
c - Brand of MSD, Pune

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