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Surgical management of cerebral coenurosis of goats in Lakhimpur district of Assam (India)

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Abstract

Cerebral Coenurosis caused by larval stage of *Taenia multiceps* has been reported from time to time in various herbivores and produces a neurological clinical condition commonly known as GID. It produces cyst and most of the cysts are located in the cerebral hemispheres and spinal cord with development of neurological clinical condition. The present study was conducted among 10 cases of goat presented with the clinical symptoms of cerebral coenurosis in Joyhing area of Lakhimpur district of Assam, India. Among the 10 cases, 7 were female and 3 were male. History and clinical finding were found to be useful diagnosing tools for clinical cases in field level and easy technique of surgical extraction of coenurus cyst from the brain under local anaesthesia is the suitable treatment for uneventful recovery with no post-operative complications.

Keywords: *Taenia multiceps*, *Coenurus cerebralis*, Coenurosis, GID, cyst, cerebral, occipital bone

Introduction

Goat is called as the "Poor Men's cow" and plays an important role in the economy of Assam. Coenurosis is caused by the larval stage of *Taenia multiceps* and it has been reported from time to time in various herbivores^[17]. *Taenia multiceps* is a gut dwelling cestodes in the small intestines of dog and other carnivores whose larval stage is *Coenurus cerebralis*. It is a transparent white coloured fluid filled bladder contains numerous invaginated protoscolices on the cystic wall^[14]. Animals infected with *T. multiceps* may contaminate the environment through the passage of gravid segments with eggs in their faeces^[13] and due to grazing over the contaminated land, infection is occurred in the herbivorous animals through oral intake of the contaminates grasses^[10]. *C. cerebralis*, the cystic stage of *T. multiceps* has been considered to develop in the cerebral location i.e., brain and spinal cord of sheep and goat^[6] and produces a neurological clinical condition commonly known as GID^[14]. Though the cyst is primarily localised in the central nervous system of sheep and goats, but it can also be seen in camels, deer, pigs, horses, and rarely in cattle and humans^[18]. Most of the cysts are located in the cerebral hemispheres and spinal cord, while it rarely invades the subcutaneous and intramuscular tissues along with other organs^[10]. Symptoms are varied depending on the cyst's location, size and compression on the brain^[10]. While *C. cerebralis* initially causes purulent meningoencephalitis, later as the cyst grows, it leads to central nervous system symptoms resulting in death^[3]. History and clinical finding were found to be useful diagnosing tools for clinical cases in field level and easy technique of surgical extraction of coenurus cyst from the brain under local anaesthesia is the suitable treatment for uneventful recovery with no post-operative complications.

Materials and Methods

The present study was conducted in Joyhing areas of Lakhimpur district of Assam, India. The site is located in the geographical coordinates of 27.3009 °N longitudes and 94.0409 °E latitude. This is an agrarian village situated to the foothills of Arunachal Pradesh. Average rainfall and humidity of the area is 3268mm and 81 percent respectively with maximum temperature goes up to 35 °C during June/July and minimum temperature falls to 8 °C in December and January.

Clinical cases of goats with the history of anorexia, head pressing against the wall, bleating and circling movement were comprised the study material. Differential diagnosis was made from listeriosis by palpating soft area when pressing with thumb over the occipital bone between the two horns.

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Based on the history and clinical findings, it is confirmed that there is presence of a cyst inside the brain of the animal.

After confirmatory diagnosis, the animals were prepared for surgical removal of the cysts. The animals were secured in lateral recumbency and the area between the two horns over the occipital bone was prepared aseptically. After surgical preparation of the area, it was desensitized by using subcutaneous application of lignocaine hydrochloride 2% solution. A triangular or V-shaped skin incision was given over the mid occipital region (Fig.1) where softness of the skull was found. After elevating the periosteum, trephining was done after removal of a circular piece of atrophied bone with B.P. blade. An atraumatic needle is inserted underneath the meninge (Fig.2) as a guard to give blunt incision over the meninge to expose the brain without damaging the brain tissues. The after giving incision on the duramater over the needle, the animal was allowed for bleating just to increase the intracerebral pressure which can help in protruding the cyst from the incision which appeared as a water filled balloon (Fig.3). The cyst was grasped with the help of an artery forceps and gently pulled it out (Fig.4). Then the bone piece is placed on the site and the skin incision was closed with non-absorbable suture materials by using simple interrupted suture technique. Post operatively, a course of broad spectrum antibiotic Ceftriaxone (15 mg/kg b.wt.) was given for 5 days and non-steroidal anti-inflammatory drugs was given Intramuscularly. Neurotropic injection was given intramuscularly at an alternate day and regular antiseptic dressing were carried out for 7 days for healing of the surgical wound. The sutures were removed after 12 days from the day of surgery after completion of the healing process



Fig 3: Protrusion of the cyst



Fig 4: Cyst after removal



Fig 1: V-shaped incision was given on the skin over the occipital bone



Fig 2: Insertion of a atraumatic needle under the meninge.

Results and Discussion

During the study period a total of 10 clinical cases of goats diagnosed as coenurosis were confirmed from clinical signs and symptoms. The female animals were found more vulnerable to this disease (70%) in comparison to males (30%). Similar findings were also reported by authors [4] in sheep. Out of total 10 diseased animals, 9 were non-descript Assam Hill goat (90%) and one was beetal (10%). From the present study, it may be said that Assam hill goats are more prone to be affected with coenurosis. The possible reason of this finding may be due to predominant distribution of Assam hill goat in this region [19]. A goat with coenurosis carries or lowers its head to alleviate the pressure exerted by the cyst and the predicted cyst locations based on the direction of circling and head deviation showed [2]. Increased intracranial pressure from the cyst compresses the surrounding brain tissue and may result in softening of an area of the skull [1]. All the cysts identified in this study, were located in the cerebral hemisphere and this finding agrees with the findings of earlier workers [11]. In this study, the goat showed marked clinical improvement after the surgical removal of the cerebral cyst. No circling movement and head pressing was seen day after the removal of the cyst. The results of the present findings support the findings of authors [12] who reported that surgery could be an effective form of treatment for coenurosis and the success rate could be high. Similar findings were also reported by the authors [7] where animal showed uneventful recovery starting from the next day of surgical removal of subdural cyst.

Conclusions

From the above study, it can be concluded that the *Coenurus cerebralis* is most frequently occurred in Assam hill goats

(90%) commonly among the female (70%). History and clinical finding were found to be useful diagnostic tools for clinical cases of *C. cerebralis* in field condition and can be treated successfully through surgical removal of the cyst from the cerebrum of the brain under local anaesthesia and animals showed uneventful recovery without post-operative complications.

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