

## **Abstract**

Gid, also known as caenurosis, coenuriasis or sturdy, is a parasitic infection that develops in the intermediate hosts of some tapeworm species (*Taenia multiceps*). It is caused by the coenurus, the larval stage of these tapeworms. The disease occurs mainly in Goat, sheep and other ungulates, but occasionally can occur in humans by accidental ingestion of tapeworm eggs. Poor nutrition, poor management, poor breeding policies, lack of regular deworming are the risk factors of Gid disease. Mortality increased and fertility was inhibited. This disease causes huge economic losses of the farmer. The present study was conducted to know about the management of gid disease of goats. A total of 10 clinical Gid cases in goats (1-3years ages; 8 females and 2 males; 7 Black Bengal goats, 1Jamnapari and 2 Cross-bred) were obtained during the Upazilla Veterinary Hospital (Shalikhha, Magura) rotation during 1 February to 1 April 2018. Cases were more frequent in female goats (8) than in male goats (2); in non-pregnant goats (5) than in pregnant goats (3). All the affected goats were found to be emaciated and listless. Circling movement, keeping the head downward to the affected side are the major clinical signs. The rectal temperature of the cases decreased significantly while the pulse rate and respiration rates underwent no significant changes. All the goats were recovered completely after surgical intervention. In all cases a crosswise incision has given at the operative site and after trephining the skull; the cyst was removed by using local anaesthetics. It is suggested that a better nutrition must be provided after surgical removal of the cyst in order to improve animal body condition.

Keywords: Gid disease, Goats, UVH, Shalikhha, Magura, Goats

### **1. Introduction**

Goats play an important role in the economy of Bangladesh (Kabir *et al.*, 2004). Many farmers of our country are landless and marginal and they depend on this small ruminant for food and economy (Paul and Saadullah, 1991). So, goat is called “Poor Men’s Cow” in our country. The population of goat in Bangladesh is 30.33 million (Banglapedia, 2014). The goat is probably the only animal which in Bangladesh is managed for multiple end uses: meat, hides, milk and manure. It provides one of the main sources of income for the farmers of Bangladesh. It is a major contributor of protein and fat and often the goat enterprise can help farmers to overcome an unforeseen crisis, which demands immediate finance.

Generally goats are resistant to many diseases. However when we rear more number of animals in one place and insufficiency of pasture facilities, intensive system of rearing leads to spread of many diseases. This causes reduced production potential and more mortality which in turn causes economic losses to the farmers. Hence identification of diseases in goat and its prevention is most important. Some of the diseases like gid, urrolithiasis, Atresia ani, pneumonia, peste des petits ruminant (PPR) etc. however become the constraints in the development of this species in Bangladesh. Ruminants comprise the major surgical patients in our country (Saunders, 1957).

Due to development of the cyst in brain, the animals start showing nervous signs. The typical clinical signs are the consequences of the localized space occupying lesions of the central nervous system (Blood *et al.*, 1971). The symptom comprises anorexia, dullness, ataxia, frequent muscle fasciculation, grinding of teeth, blindness, stumbling, paralysis, incoordination and erratic movement (Abera and Abdela, 2016; Doherty *et al.*, 1989). There is no effective medical treatment against the disease. The affected animal leads to death unless the cyst is surgically removed from the brain. The objectives of this study were to handle and manage gid disease through surgical processes to control the disease. Greig (1977) published an account of the disease with suggestions for locating cysts and their subsequent surgical removal, although he offered little guidance for dealing with cases in which there is no skull softening. Some progress has been made since then, in current textbooks, aspiration of the cysts is recommended if the overlying skull bulges or softness (Young, 1978).

Gid disease predominantly occurs in goats. The disease may also affect cattle, buffalo, sheep, horse, man (Blood, *et al.*, 1971; Rao, 1973; Gerig, 1977). Rarely Camel may be affected.

Mainly the predilection site of the *Coenurus cerebralis* is the central nervous system. Also the development may occur in the heart, diaphragm, and base of the ear and thigh muscle (Bhalla, *et al.* 1962; Singh and Singh, 1972). *Coenurus* cysts are located mainly in the brain and spinal cord. In sheep, the cysts were found in the cerebral hemisphere in 96% of the affected cases (43% in the left hemisphere and 57% in the right) with the remaining 4% presented in the cerebellum (Doherty *et al.*, 1989). The early stages of migration through nervous tissue usually passes unnoticed, but in heavy infections an encephalitis may be produced. Most signs are caused by the mature *coenurus*, which may take 6 to 8 months to develop to its full size of about 5 cm. The cyst like *coenurus* develops gradually and causes pressure on nervous tissue, resulting in its irritation and eventual destruction. It may cause sufficient pressure to rarefy and soften cranial bones, leading to a larger volume of calvarium, compared with uninfected controls. In a typical cycle, the egg of *T. multiceps* in dog faeces is ingested by goats (or other intermediate hosts such as humans). There the larva develops, forming a fluid-filled, bladder-like cyst within which multiple protoscoleces (tapeworm larvae) develop. Such a structure is called a “*coenurus*”- hence the name of the disease. The species of *Taenia* that cause *coenurosis* typically have a remarkable affinity for the CNS. The mechanism(s) by which migrating larvae identify neural tissue and preferentially locate in the CNS is unknown. In the CNS the *coenurus* enlarges slowly (reaching infective stage in about 6-8 months), causing a fatal disease in goats called “blind staggers.”

## CHAPTER-II

### **2. Materials and Methods**

The study was carried out at Upazilla Veterinary Hospital, Shalikh, Magura for surgical management of gid disease in goats reared under existing village condition of Magura district. A total of 10 goats were selected for surgery among them 7 were black Bengal, 1 was Jamunapari and 2 cross-bred and again 8 of them were female and 2 was male. Among females, 3 were pregnant. Surgery has been done to remove the cyst in only 6 cases out of 10. The remaining 4 cases have not been handled due to the unwillingness or reluctance of the owners. Diagnosis of intracranial cysts was made on the basis of history, clinical signs and clinical examination. The total animals brought to the hospital was assumed as the total samples. Their history and clinical signs were recorded carefully and information about age, sex, and breed were also recorded. The animals showing cessation of feeding, circling movements, repeated bleating and skull softening in the horn base were diagnosed as Gid disease, radiological test or allergic test also done. Unilateral thinning was the most reliable sign both for diagnosis and cyst location, being on the same side. After diagnosis, the cyst was removed by following surgical technique.

#### ***Technique of Gid operation***

The animal was controlled manually and the operative site was clipped, shaved, scrubbed with soap and water followed by application of tincture of iodine paint over the skin. Razor blade, scalpel handle with blade, rat-tooth forceps, artery forceps, probe, syringe, needle, cotton, nylon or silk suture and 2% Lignocaine Hydrochloride (Jasocaine A; Jayson, Bangladesh) solution were the materials, used in these operations. Soon after sterilizing the operative site, local blocks around the area were given with 2% Lignocaine Hydrochloride solution as local anaesthetics. The operation was performed wearing mask, cap, sterilized apron and hand-gloves. One half-moon shaped incision on the skin was given to make one flaps, then the skin was detached from the subcutaneous tissue by blunt dissection. Haemorrhage was controlled by applying swabs and artery forceps when necessary. The subcutaneous tissue over the bone was scrapped to expose the bone.

Again, the bone was scrapped by scalpel and a circular portion of the bone, sufficiently large enough to remove the cyst was made with the sharp edge of the blade. Local anaesthetics were spread over the meninges and incision was given through it to expose the brain tissue. The cyst was cleared by blunt dissection from the underlying brain tissue. After this, the cyst tended to move quickly towards the exposed brain surface, a process favoured by rotation of the head so that the cyst could move downward. This greatly simplified the handling and removal of the cyst. The cyst was then slowly removed by pulling it through simple forceps.

Utmost care was taken not to allow the cyst to rupture and fall the fluid in the brain. Attempts were not made to remove the fluid by syringe and needle to avoid accidental drainage of the fluid into the cranial cavity. After removal of the cyst, sulphanilamide powder or crystalline penicillin powder was dusted on the wound. The incised border of the meninges was brought in apposition to cover the brain tissue. The one flaps of the skin were sutured by interrupted suture with nylon. Tincture of benzoin seal was then applied over the wound. In very weak animals, 100 to 200 ml of 5% dextrose saline was dripped continuously in to jugular vein during operation.

The post-operative treatment consisted of daily injection of penicillin & streptomycin as recommended doses for 5 days, associated with application of anti-histaminic and anti-inflammatory drugs with good nursing and care. The suture was removed between 8-10 days following operation. The location and number of cyst removed were recorded. Sex wise distribution of the disease was also recorded. Cerebral coenurosis can be controlled by regular anthelmintic treatment of dogs at 6–8 week intervals, by using an effective taenicide, and correct disposal of sheep and goat brain after slaughtering or death of animals to prevent scavenging by dogs belonging to the general public, which may not receive regular anthelmintic treatment (Scott, 2012). According to Ghazaei (2007) combination of fenbendazole together with praziquantel and albendazole is effective against the cerebral coenurosis. He has shown that praziquantel administration with dosage rates of 50 to 500 mg/kg resulted in successful treatment of this metacestode.

### 3. Results and Discussion

The determination of the exact location of the cyst in the brain is of prime importance for surgical operation and success of surgery mainly depend on proper location and early diagnosis. In the present study, location of cysts was done with history, clinical sign, and palpation. Only the periosteum and skin were replaced. These observations support the findings of Sharma (1975) and Shrivastava (1977).

Out of 10 selected surgical cases, 6 goats were subjected to surgical operations (Figures 1, 2, 3 and 4). The effects of age, breed and sex of animal on the occurrence of gid disease is presented in Tables 1, 2 and 3 respectively. In this study, the disease predominantly (80%) occurred in animals between 1.1 to 2 years of age as shown in Table 1. The female animals were more vulnerable to the disease (80%) than males (20%) as presented in Table 3. These findings support the earlier investigation of gid disease (Sharma and Tyagi, 1975; Doherty *et al.*, 1989. Possible reason of this may be the following: the brain at this age may be more suitable for the establishment of infection. Among the female animals studied, pregnant animals were 37.5%. Out of total 10 diseased animals, 7 were Black Bengal (70%), and one was Jamunapari (10%), and 2 were cross-bred (20%). From the present study, it may be said that Black Bengal goats are more prone to be affected with coenurosis (Table 2). The possible reason of this finding may be due to predominant distribution of Black Bengal goats in our country. All the cysts identified in this study, were located in the cerebral hemisphere. This finding agrees with the findings of earlier workers (Sharma and Tyagi, 1975; Nooruddin *et al.*, 1996; Ahmed and Haque, 1975). In the present study, 58.33% of the cysts were located in the right cerebral hemisphere and 41.66% in the left cerebral hemisphere. Ahmed and Haque (1975) reported that, in Bengal goat, 47.8% of the cysts were located in the right cerebral hemisphere and 39.1% in the left cerebral hemisphere. This finding is almost similar to the finding of the present study. In this study, 91.66% of the animal examined had one cyst and only 8.33% had two cysts. Ahmed and Haque (1973), however, reported that 63% of the cases had one and 32% had two cysts. All the cysts, which were located in the cerebral hemisphere, were found to be located clinically caudal to the base of the horn. When one cyst was present in this situation, the animal was found to keep its head downward and turning it towards the affected side and circling was observed towards the affected side, which is

supported by Soulsby (1968); Blood *et al.* (1971) and Sharma and Tyagi, 1975. In one case cyst was found on the cerebral hemisphere caudal to the base of both the horns. In this case, circling movement was not observed. The animal remained standing in place. These were supported by Ahmed (1973) and Skerritt and Stallbaumer (1984). Soulsby (1968) suggested that, in many cases, treatment is of no value. However, in this study, goats showed marked clinical improvement after the surgical removal of the cyst. The results of the present findings support the findings of Skerritt and Stallbaumer (1984) who reported that surgery could be an effective form of treatment for gid disease and the success rate could be high.

## TABLES

<b>Table 1. Effect of age on gid disease. Parameters</b>	<b>No. of animals affected</b>	<b>Percentage of occurrence</b>
1) Up to 1 year	1	10
2) Between 1.1-2 years	8	80
3) 2.1 years or over	1	10

<b>Table 2. Effect of breed on gid disease. Parameters</b>	<b>No. of animals affected</b>	<b>Percentage of occurrence</b>
1) Black Bengal	7	70
2) Jamnapari	1	10
3) Cross-bred	2	20

<b>Table 3. Effect of sex on gid disease. Parameters</b>	<b>No. of animals affected</b>	<b>Percentage of occurrence</b>
1) Male	2	20
2) Female	8	80
a) Pregnant	3	37.5
b) Non pregnant	5	62.5





**Figure 1. Gid disease affected goat**



**Figure 2. Lesion of gid disease just caudal to horn (right side).**



**Figure 3. Removal of cyst of *Coenurus cerebralis* from the skull.**



**Figure 4. Suturing the skin by nylon**

## CHAPTER-IV

### **Limitations:**

1. The owners are not always interested for surgical procedures.
2. The owners are reluctant to follow-up treatment
3. It was difficult to maintain aseptic environment always in the field level
4. The number of the disease sample size was very small
5. There was no enough scope of post mortem examination of affected animals in the field level

## CHAPTER-V

### **Conclusions**

Clinical study was conducted in 10 affected cases of gid in goats and method of surgical management was observed. History and clinical findings were found to be useful diagnosing tools for clinical cases in field level. Easy technique of surgical extraction of coenurus cyst from the brain under local anaesthesia has been described with no post-operative complication and uneventful recovery. The disease more frequently occurred in goats between the ages of 1.1 to 2 years and more commonly in female (80%) than male (20%) and also occurred. Therefore, further study should be conducted with clinico-pathological effects of the disease by the species of causal parasites by artificial production and therapeutic Anthelmintic trials to prevent the disease.

## CHAPTER-VI

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## CHAPTER-VII

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