

RECURRENT TYMPANY IN BUFFALOES

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ABSTRACT

The study were conducted on 31 local female buffaloes breeds ,In basrah –Iraq , during the period from 2010 – 2013 , 6 – 15 years old, among these 21 local female buffaloes breeds show signs of recurrent tympany one to two months after parturition, and 10 clinically healthy local female buffaloes breeds were served as controls , moreover living status and kind of forage was archived before and after parturition , nevertheless almost cases were not respond to the classical treatment when it given by the owners. Results of ruminal histopathological examination after rumenotomy indicated rumenitis , ruminal adhesions and keratosis of rumeinal wall . It have been concluded that changing to holly concentrated food in late stage of the pregnancy might considered as the important cause of frothy tympany.

INTRODUCTION

Bloat is an over distention of the rumen and reticulum with the gases of fermentation(1). Bloat can be divided into primary and secondary, primary is also known as legume, dietary or frothy bloat , It generally occurs up to 3 days after animals begin anew diet, moreover certain legumes such as alfalfa ,ladino clover, and grain concentrates ,promote the formation of stable foam (2) , furthermore secondary tympany is caused by a physical or functional obstruction or stenosis of esophagus resulting in failure to eructate (3).Vagus indigestion or other innervations disorders, esophageal papilloma, lymphosarcoma ,and esophageal foreign bodies are examples of causes of secondary tympany (4) .

Foam mixed with rumen contents physically blocks the cardia preventing eructation and causing the rumen to distend with gases of fermentation. (5).

Recurrent rumen tympany is frequently a sign of digestive disease in young calves ,the tympany is usually moderate and results from accumulation of free gas in the reticulo-rumen (6) . In adult animals, free-gas bloat is less frequent and usually more acute because disturbances of the adult rumen tend to be more rapid and severe (7).

It have been thought that vagus indigestion was caused by vagal nerve dysfunction through vagal nerve injury associated with complications of traumatic reticuloperitonitis, therefore it was hypothesized that the inflammatory and scar tissue lesions were concern vagal nerve fibers supplying the forestomach and abomasum, anorexia and decreased

milk production were the most common clinical signs shown by affected animal ,however reluctant to move , arched back and frothy bloat were also recorded(8) .

Bloat is a complex disease but simply expected under field conditions, as a result, field observations have led to varied and different theories about its causes and facts ,therefore the aim of the present work were to investigated clinical cases of recurrent tympany affected buffaloes in Basrah –Iraq .

MATERIALS AND METHODS

Animals and clinical examinations :

The study was carried out in Basrah province (Basrah-Iraq) on 31 local female buffaloes breeds ,6 – 15 years old during the period from 2010 – 2013 , among these 21 local female buffaloes breeds show signs of recurrent tympany one to two months after parturient, and 10 clinically healthy local female buffaloes breeds were served as controls. Careful clinical examination had been overtook in all diseased and normal control buffaloes. A complete history was recorded upon presentation (case history , age, gestation status and calving dates were extracted from the veterinary records), moreover emphasis was placed on clinical signs observed, course and duration of the presenting complaint, moreover According to the severity of tympany it have been classified into mild , moderate, and sever form (Table 1) .

Table (1) Classification of bloat according to its severity

Type of bloat	Severity of clinical signs
Mild Bloat	The left paralumbar fossa is distended, the animal is not in distress, moreover the skin over the left paralumbar fossa were less tented and easily grasped ,
Moderate Bloat	The distension is more obvious ,however the animal may appear anxious and slightly uncomforted, and the skin over the paralumbar fossa is usually taut but some can be grasped or tented
Sever bloat	There are clear distension of both sides of the abdomen and there were breathe through its mouth with protrusion of the tongue, the animal were uncomforted , restless and may be staggering, in addition that the skin located over the left flank is very tense

Rumenotomy have been done by classical and routine surgical methods ,in addition , ruminal biopsy were collected after rumenotomy , fixed in formalin solution (10%) for 48 hours, trimmed to suitable sizes, then washed and dehydrated, cleared in xylol, after that it were embedded in paraffin wax and finally sectioned at 5-6 μ m thickness, and stained with hematoxylin and eosin and examined with light microscope (9).

Statistical analysis :

Significance of variations in values of disease buffaloes and those of normal control animals were analyzed statistically using student t-Test (10).

RESULTS

According to the severity of tympany it have been classified into mild(23.8%), moderate(47.7%) and severe form(28.5%) Table (2).

Table (2) Percentage of bloat according to its severity .

Type of bloat	%
Mild bloat	23.8%
Moderate bloat	47.7%
Sever bloat	28.5%

In mild bloat, the left paralumbar fossa is distended, the animal is not in distress, moreover the skin over the left paralumbar fossa were less tented and easily grasped . On the other hand in moderate bloat, the distension is more obvious ,however the animal may appear anxious and slightly uncomforted, and the skin over the paralumbar fossa is usually taut but some can be grasped or tented, moreover In severe bloat, there is clear distension of both sides of the abdomen and there were breathe through its mouth with protrusion of the tongue, the animal were uncomforted , restless and may be staggering, in addition that the skin located over the left flank is very tense.

In general ,diseased buffaloes show signs of tympany(100%) with different degrees but recurrent ,with distension of rumen on the left side more obvious in the upper left paralumbar fossa ,however , the distention continues to the entire abdomen some times(28.5%) .Diseased animals were discomfort whereby stand and lie down different times(57%) , kick at its abdomen and even might roll down themselves (9.5%) , staggering gait (23.8%), frequent defecation and urination are common(42.8%), dyspnea is easily detected on diseased animals (85.7%) which might accompanied by mouth breathing(57%), excessive salivation(52.3%), extension of the head (57%) and recumbancy (33.3%) (Table 3).

Table (3) Clinical signs of diseased buffaloes with recurrent tympany .

Clinical signs	%
Recurrent tympany with abdominal distension	100
The abdominal distention continues to the entire abdomen	28.5%
Discomfort and stand and lie down different times	57%
kicking at its abdomen and are rolling down themselves	9.5%
Staggering gait	23.8%
Frequent defecation and urination	42.8%
Dyspnea with mouth breathing	85.7%
Excessive salivation	52.3%
Extension of the head	57%
Recumbancy	33.3%

Moreover there were significant change in respiratory , heart rate and ruminal contractions in diseased buffaloes compare with controls. Table(4).

Table4: Body temperature, respiratory and heart rate and ruminal contractions of diseased buffaloes and controls.

Parameters	Control buffaloes \pm S.E	Diseased buffaloes \pm S.E
Body temperature C ^o	39.1 \pm 0.77	39 \pm 0.12
Respiratory rate/mint	22.35 \pm 3.78	15.78 \pm 4.56**
Heart rate/mint	77.83 \pm 6.52	97.23 \pm 5.31**
Ruminal contractions / 5 mints	5.83 \pm 0.75	1.33 \pm 0.45**

** (P<0.01), Values are mean \pm standard error of mean.

Results of histopathological changes reveals that there are different projections in ruminal layers , Fig. 1,with inflammation (ruminitis) ,since proliferation of cells laying mucosal layers and edema are evident, Fig. 2 , however hemorrhage of mucosa and sub mucosa can be detected, Fig. 3 , Furthermore, ruminal hyperkeratosis and vaculations of muscles were also seen, Fig. 4 and 5.

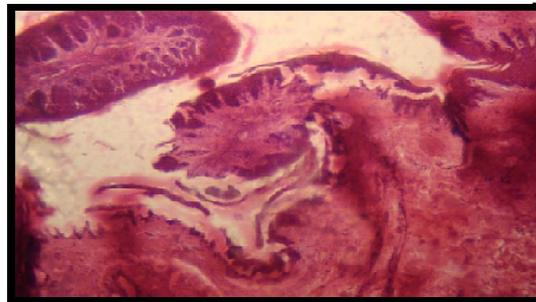


Fig. 1: Section of buffalo rumen show projections of mucosal layer H&E X10.

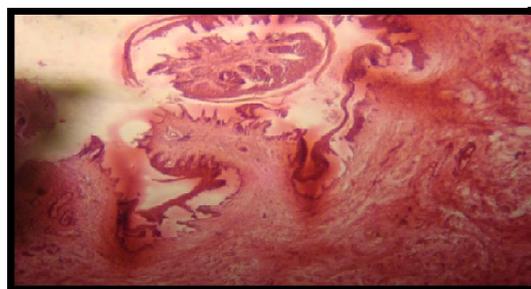


Fig. 2: Section of buffalo rumen show (ruminitis) proliferation of cells laying of mucosal layer & edema H&E x10.



Fig. 3: Section of buffalo rumen show haemorrhage of mucosal & submucosal layer H&E X10.

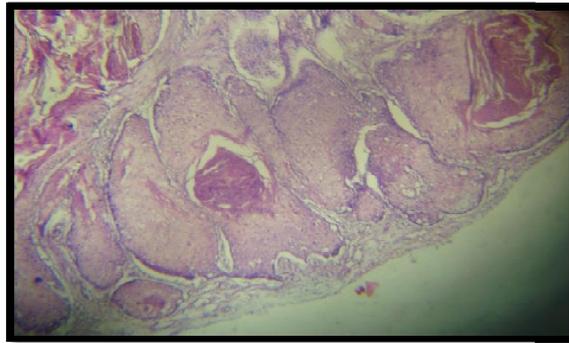


Fig. 4: Section of buffalo rumen show hyperkeratosis of mucosal layer cells H&E X10.

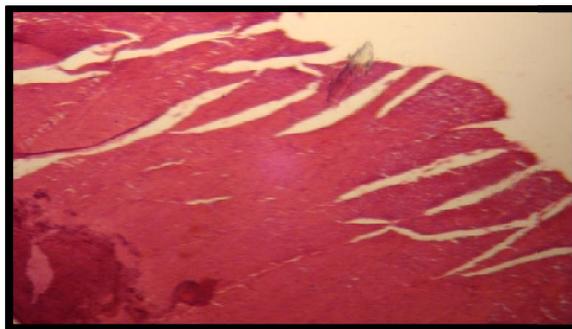


Fig. 5: Section of buffalo rumen show vacuations of muscles H&E X10 .

DISCUSSION

Ruminal tympany is abnormal distension of the rumen and also reticulum caused by excessive retention with gases of fermentation, either in the form of a persistent foam mixed with the rumen ingesta or as free gas separated from ruminal contents (2). It has been postulated that froth bloat is associated with high-level grain diets in animals fed concentrates since the viscosity of the ruminal fluid is increased because of the production of insoluble slime by certain species of bacteria that proliferate to create large numbers in animals on a high-concentrated diet especially carbohydrates (11). The slime may entrap the gases of fermentation. (1). Any delay in event of froth bloat in feedlot animals might suggest that a slow change in the ruminal microbes that is considered as an important element in explaining the cause, furthermore the physical form of a grain ration appears to be related to grain bloat, since in frothy legume bloat, in which a rapid release of leaf nutrients is important in producing bloat, it seems likely that the small particle size of ground feed could have the same effect.(12).

The fore stomach is a glandular part, nevertheless, ruminal microflora will break down ingesta by mechanical and chemical action into small chain fatty acids, which were directly absorbed through the epithelium into the blood (13). Ruminal papillae were shaped and sized according to diet, therefore it might become longer with high roughage diets and shorter when the ration becomes more concentrates(14). Animals consuming diets with less than 10% roughage can develop ruminal hyperkeratosis, however these rumen papillae become brown, hard and often, aggregated papillae(15).

It has been thought that the epithelial layer of forestomach functions were protective barrier for the forestomach and for the metabolism of ingesta and absorption of volatile fatty acids (16), moreover any problems within the stomach motility as well as damage of microflora will alter the forestomach functions resulting in a change in digestion substrate promoting the growth of particular organisms followed by ruminal pH change which might affect the integrity of the mucosal lining of forestomach or cause the production of excessive gas, resulting in indigestion (17), furthermore it has been shown that ventral vagal nerve injury resulted in achalasia of the reticulo-omasal orifice which inhibited the passage of ingesta from the reticulorumen into the omasum and abomasum, resulting in distension of the rumen with frothy contents because of increased time and maceration in the reticulorumen(18,19). However Majak (5) added that the most important accepted causes of bloat include, an inheritance for tympany beside specific proteins in diet, the quantity and quality (amount and rate) of roughage which is intake, the rumen microbial population and types, and enlargement of the mediastinal lymph nodes which will compress the esophagus or interfere with the function of the vagus nerves after respiratory infection.

Saliva contains material called mucin, which functions as an antifoaming agent, and has been shown to suppress the formation of rumen foam, it would be acceptable that saliva production may be lower in bloating animals, due may be to a result of selective grazing of higher quality forages followed by less rumination and/or a genetic difference in saliva and mucin production among animals (3).

When bloating occurs, these gases cannot escape, they continue to build up and cause severe distention of the abdomen, moreover the affected animal might feel acute pain

reflected by discomfort and stand and lie down different times, may be kick at its belly and roll its self , furthermore on clinical aspect bloat cause decrease respiratory rate due to compression of the thorax followed by Dyspnea and difficult breathing ,however the compression might affected heart lead to increase its rate and intensity causing death in some cases (6). As well preventing bloat is desirable not only to reduce deaths, but also to reduce the bad effect of bloat on animal performance and activity (20,21).

النفخ المتكرر في الجاموس

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الخلاصة

شملت هذه الدراسة فحص ٣١ من إناث الجاموس المحلي بأعمار تراوحت بين ٦-١٥ سنة ، في البصرة – العراق، للفترة من ٢٠١٠ ولغاية ٢٠١٣ ، إذ عانت واحد وعشرون جاموسة من أعراض النفخ المتكرر وبخاصة بفترة شهر إلى شهرين بعد الولادة ، كما استخدمت عشرة جواميس سوية سريريا عدت كمجموعة سيطرة. تم الأخذ بنظر الاعتبار طبيعة معيشة الحيوانات ونوع الغذاء المستخدم فضلا عن ذلك إن جميع الحيوانات المريضة لم تستجب للعلاج السريري للنفخ . أظهرت نتائج الفحص النسجي المرضي بعد إجراء عملية فتح الكرش وضوح التهاب الكرش والتصاقاته فضلا عن خشونة جداره . استنتج من هذه الدراسة إن إعطاء الأعلاف المركزة في نهاية فترة الحمل قد يكون ذا أثر سلبي على الحيوان وقد يُعد احد الأسباب المهيئة لإحداث النفخ .

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