Diagnostic and therapeutic approaches in buffaloes affected with ruminal indigestion and foreign body syndrome

CN Vijaykumar, Bhagavantappa B, Dilipkumar D, Doddamani Jahangirbasha, Vivek R Kasaralikar, Prashantkumar Waghe and Venkatgiri

Abstract
The clinical research was conducted to evaluate ruminal indigestion and foreign body syndrome in 32 affected buffaloes presented to Veterinary College, Bidar. In group I (13) healthy buffaloes, group II (13) buffaloes with ruminal indigestion and group III (6) buffaloes with foreign body syndrome (FBS) were evaluated. Clinical examination was carried out to evaluate rectal temperature, respiratory rate, heart rate and ruminal contractions. Radiographic examination was carried out to evaluate abnormality in reticulum and diaphragm. On clinical examination rectal temperature, heart rate, respiratory rate varied non-significantly whereas ruminal contractions were significantly reduced to 0.69±0.13 and 1.17±0.15 / 3 min in group II and III buffaloes respectively. Radiographic examination revealed presence of non-potential foreign bodies in reticulum of buffaloes of group II, whereas potential foreign bodies and abnormal silhouette of reticulum with discontinued diaphragmatic line in buffaloes of group III was observed. Exploratory rumenotomy was performed under paravertebral anaesthesia using 2% lignocaine hydrochloride for retrieval of potential foreign bodies (binding wire and nail) to confirm radiographic findings and treat the affected buffalo. So rumenotomy becomes the most essential and first line of treatment in buffaloes affected with foreign body syndrome. Additionally, ultrasonography was used as a diagnostic modality to evaluate reticulum in group II and III buffaloes. Reticular motility/4 minute was significantly reduced in group II and III buffaloes. Uneven contour of reticulum wall, significant increased reticulum wall thickness and distance between abdominal wall to reticulum was observed in group III buffaloes.

Keywords: Buffalo, indigestion, foreign body, radiography, rumenotomy

Introduction
Buffaloes and cows have unselective feeding nature, results in consumption of foreign bodies and these foreign body lodges into the reticulum and resulting in reticular disorders like traumatic reticuloperitonitis (TRP), acute per reticular inflammation, adhesions and abscess (Abdelaal et al., 2009) [1]. These affected ruminants on clinical examinations are initially diagnosed with chronic ruminal indigestion. Pain and inappetence are the important clinical signs elicited by the animal in TRP (Radostits et al., 2007) [14]. As the science advanced in imaging modalities with its application in veterinary field radiography helped in detecting radio dense foreign bodies in reticulum with its location in the body (Braun et al., 1993; Braun et al., 1994) [7, 6]. However the inflammatory and structural changes of the reticulum serosa with its contractile pattern are not detected in radiography (Fubini et al., 1990) [9]. The importance of present study is clinical and radiographic evaluation of reticulum in Indian buffaloes affected with ruminal indigestion and foreign body syndrome. Therefore present study was carried out with the objectives of clinical and radiographic evaluation of reticulum in healthy and compared with buffaloes affected with ruminal indigestion and FBS.

Materials and Methods
The clinical study was carried out in three groups comprising of 32 buffaloes presented to the Veterinary College, Bidar. The group I include 13 healthy buffaloes and treated as control. Whereas group II (13 no.) and III (6 no.) consist of buffaloes affected with ruminal indigestion and FBS respectively. Anamnesis of the patient was recorded to know feed and water intake, duration of illness, rumination, tympany and faecal output.

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The detailed signalmen with respect to species, breed, age, sex, body weight and pregnancy status were recorded in all buffaloes of group II and III. The clinical and physiological parameters like rectal temperature, respiratory rate, heart rate, ruminal contractions per three minute and per rectal examination findings were recorded (Sharma et al., 2009) [15]. Radiographic examination of Thoraco-abdominal in buffaloes was carried out with right lateral reticulography in standing position with exposure factors of KVP 90-113, 53 mAs, 90-110 cm as film focal distance (Makhdoomi et al., 2018) [11] for evaluation for presence of foreign body, abnormality in the reticulum and diaphragm. The research data were evaluated by student t-test (Snedecor and Cochran 1994) [16]. The left flank exploratory rumenotomy was performed aseptically under paravertebral anaesthesia technique in standing position using 2% lignocaine hydrochloride to confirm radiographic findings.

Results and discussion
The mean duration of illness was 3.53 and 4.83 days in group II and III buffaloes affected ruminal indigestion and FBS respectively suggestive of early case presentation. On the contrary, the duration of illness was 15.11±2.50 days in bovines with localized peritonitis (Athar et al., 2010a) [3]. Tympany was observed only in 50% (3) buffaloes of group III the non-selective feeding nature of bovines (Athar et al., 2010b) [4]. Few cases if found which was incidental and it might be due to foreign bodies were not found in the reticulum. However in bovines affected with rumen impaction usually presence of non-potential foreign bodies as shown in Figure 2. The left flank exploratory rumenotomy was performed in one buffalo of group I represents reticulum in relation to other visceral organs. a) Reticulum wall b) Reticulum c) Diaphragmatic line d) Caudal venacava e) Lung f) Heart g) Sternum. Cr: Cranial, Cd: Caudal

Radiographic examination in group I buffaloes revealed normal silhouette of reticulum with intact diaphragmatic line as shown in Figure 1. Radiographic examination of group II only 4 (30.76%) buffaloes revealed presence of non-potential foreign bodies as shown in Figure 2. Similarly in bovines affected with rumen impaction usually foreign bodies were not found in the reticulum. However in few cases if found which was incidental and it might be due to the non-selective feeding nature of the bovines (Athar et al., 2010b) [4]. In group III radiographic evaluation of 6 buffaloes revealed abnormal silhouette of reticulum with discontinued diaphragmatic line in 33.33% (2) buffaloes and the potential foreign bodies were found both in the abdomen of reticular ventral floor (4 buffaloes) and also intrathoracic (2 buffalo) as shown in Figure 3 and 4. Radio dense metallic foreign body within the thorax and overlying ventral border of the heart with discontinuation of the diaphragm in buffaloes were observed (Aref and Abdel-hakiem, 2013) [2] suggestive of diaphragmatic hernia and FBS. In one buffalo of group III potential foreign body (binding wire) was detected on radiography with intact diaphragmatic line as shown in Figure 5.

Table 1. Mean ± SE values of Clinical parameters in group I, II and III buffaloes

<table>
<thead>
<tr>
<th>Sl. no</th>
<th>Clinico-haemato biochemical parameters</th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reticular contraction (number of contractions/3 min)</td>
<td>2.62±0.14</td>
<td>0.69±0.13**</td>
<td>1.17±0.15**</td>
</tr>
<tr>
<td>2</td>
<td>Respiratory rate (breathes/minute)</td>
<td>18.62±1.11</td>
<td>23.23±3.65</td>
<td>17.67±2.89</td>
</tr>
<tr>
<td>3</td>
<td>Heart rate (beats/minute)</td>
<td>56.46±2.25</td>
<td>63.69±3.84</td>
<td>64.00±5.01</td>
</tr>
<tr>
<td>4</td>
<td>Rectal temperature (°F)</td>
<td>100.46±0.29</td>
<td>100.08±0.46</td>
<td>100.25±0.79</td>
</tr>
</tbody>
</table>

Mean values bearing superscript* differ significantly at (p≤ 0.05) between the groups
Mean values bearing superscript** differ significantly at (p≤ 0.01) between the groups

Fig 1: Right lateral thoraco-abdominal plain radiograph in a healthy buffalo of group I represents reticulum in relation to other visceral organs. a) Reticulum wall b) Reticulum c) Diaphragmatic line d) Caudal venacava e) Lung f) Heart g) Sternum. Cr: Cranial, Cd: Caudal
Additionally as a diagnostic modality ultrasonography was performed in group II and III buffaloes. In group III buffaloes, irregular shape and uneven contour of reticulum wall was observed as shown in figure 6 and 7 respectively. Liver abscess was detected ultrasonographically in one buffalo and to confirm the findings ultrasound guided fine needle aspiration of pus was performed. The liver abscess was turgid with diameter of 4.32 cm before ultrasound guided aspiration of pus and became flaccid with diameter of 2.66 cm after ultrasound guided aspiration of pus as shown in Figure 8.
Exploratory rumenotomy was performed in 3 buffaloes of group III affected with FBS. It was a primary step in treatment of buffaloes affected with FBS with retrieval of potential and non-potential foreign bodies from rumen and reticulum as shown in Figure 9. Laparo-rumenotomy was performed in sharp foreign body syndrome affected buffaloes and foreign bodies were retrieved which were detected on radiography (Aref and Abdel-hakiem, 2013) [2]. Exploratory rumenotomy helped in confirming radiographic findings. The potential foreign bodies were found both in the abdomen of reticular ventral floor (4 buffaloes) and also intrathoracic (2 buffalo). The six radiopaque foreign bodies were nail (1 buffalo), binding wire (2 buffaloes) and other three buffaloes with metallic sharp foreign bodies as shown in Figure 10.

Conclusion
In buffaloes affected with ruminal indigestion and foreign body syndrome have not showed significant variation in clinical parameters evaluation like rectal temperature, heart rate, respiratory rate however, ruminal contractions were significantly reduced to 0.69±0.13 and 1.17±0.15 /3 min in group II and III buffaloes respectively when compared to control group. Radiographic examination revealed presence of non-potential foreign bodies in reticulum of buffaloes of group II and group III in addition to that abnormal silhouette of reticulum with discontinued diaphragmatic line was observed in buffaloes of group III. Ultrasonography could be used as imaging tool for diagnosis, therapeutic, post therapeutic and prognostic indicator of reticulum in buffaloes affected with ruminal indigestion and FBS. Radiographic and ultrasonographic findings were complimentary to each other in buffaloes affected with ruminal and foreign body syndrome. Rumenotomy becomes the most essential and first line of treatment in buffaloes affected with foreign body syndrome. However, buffaloes with ruminal indigestion therapeutic management were enough to recover from indigestion. To confirm the clinical, radiographic, ultrasonographic and fine needle aspiration findings laparo-rumenotomy was very important surgical procedure in buffaloes affected with foreign body syndrome. So, exploratory rumenotomy was performed under paravertebral anaesthesia using 2% lignocaine hydrochloride for retrieval of potential foreign bodies (binding wire and nail) from affected buffaloes.

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References


