



Research Article

TRANS-ABDOMINAL ULTRASONOGRAPHIC STUDIES IN JEJUNAL, ILEAL AND CAECAL DISORDER OF COWS AND BULLS

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Abstract- Forty six bovines comprising of dairy cows, bulls and calves were investigated for the complaint of reduced to complete cessation of feed intake, scanty to cessation of dung and reduction in milk yield. The study included 19 chronically affected animals which were suspected for fore and hind gut disorders on the basis of their history and clinical signs. Affected animals were found to have ultrasonographic evidences of various forms of abdominal disorders viz. reduced to cessation of reticular motility, jejuno-ileal intussusception, caecal dilatation, chronic peritonitis and dilated large intestinal loops. Transabdominal ultrasonographic measurement of intestines revealed jejunal loops dilatation of 4.75 ± 0.2 cm cross bred cows, 3.7 cm in heifer and 3.85 ± 0.15 cm in bulls and caecal dilatation of 3.5 ± 0.22 mm in cross breed cows and 4.16 ± 0.41 mm in 3 bulls. The trans abdominal ultrasonographic assessment helped in visualization and to assess the functionality of the internal organs (intestine and reticulum) and categorization for treatment planning.

Keywords- Cattle, Intussusception, Caecal dilatation, Peritonitis, Trans abdominal Ultrasonography

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Introduction

Intestinal disorders of bovines remain a challenge for farmers for many reasons; it also remains as a diagnostic challenge for bovine practitioners. Cows with long standing anorexia and devoid of dung for more than 3 days indicate the possibilities for flow obstruction either in abomasum or in intestines and possibly due to ileus. A common cause of ileus is intussusceptions. It can be determined best by ultrasonographically rather than radiographically, as ultrasound is a non-painful and non-invasive modality. Ultrasound has advantage for its higher utility in diagnosis of proliferative intestinal inflammations in cattle. Trans-abdominal Ultrasonography is an ideal diagnostic tool for the intervention of gastrointestinal and to diseases of various gastrointestinal disturbances like abscess, peritonitis and organ displacement [1]. Ultrasound allows a "cow-side" diagnosis and can reduce time and money for the producer and spare pain for the animal [2]. The cattle in Cauvery delta regions of Thanjavur in Tamil Nadu were, often presented with various gastrointestinal disorders and in turn many of these are finally referred to referral veterinary centres. The aim of the present study was to undertake transabdominal ultrasonographic assessment of intestinal disorders in cattle of Cauvery delta region.

Materials and Methods

Referral medical investigations were under taken in 46 bovines comprising of dairy cows, sporting bulls and calves which were presented to the Large Animal Medicine Referral Clinic of Veterinary College and Research Institute, Orathanadu, Thanjavur, Tamil Nadu. These cattle were presented with the complaints of reduced to complete cessation of feed intake ranging from 4-5 days, scanty to complete cessation of voiding of dung ranging from 3-6 days and cessation of milk yield. The study was conducted during the period of July 2017 to January 2018, with the affected cattle presented from various parts of delta

regions of Thanjavur. All affected animals were subjected to detailed clinical examination [3] followed by transabdominal Ultrasonography [2, 4]. Transabdominal ultrasonographic examination was performed in standing posture without sedation using a 2.5 to 5 MHz curvy linear probe with Esoate Mylab 1.0 Ultrasound system, in all these cattle. Affected animals were found to have ultrasonographic evidences of various forms of abdominal disorders viz. reduced to cessation of reticular motility, jejuno-ileal intussusception, caecal dilatation, peritonitis and dilated intestinal loops.

Results and Discussion

On clinical examination, the animals were dull and depressed with dry muzzles and sunken eyes. The rectal temperatures were subnormal. Respiratory rates were found to be elevated along with shallow respiration. The heart rates of the affected animals were found to be slightly elevated. Abdominal auscultation on right side revealed tinkling sound in 2 cows and 3 bulls which were later diagnosed as caecal dilatation. Mild tinkling and fluid splashing sounds of borborygmy were observed in 6 cases. No sounds were observed in 8 animals. Per rectal examinations revealed absence of dung with dryness of rectal mucosa in all the cattle. Rectal palpation helped in confirmation of intussusceptions and caecal dilatation, in 4 cows and 2 bulls were respectively. In these animals, the obstructed portions of intestine were felt as a hard and thick impacted mass / balloon shape with blind end and its distension. The manipulation of these segments elicited severe pain response by animals and such cattle had tendency to lie down and groan, during such occasions. To further explore the status of intestines, trans abdominal ultrasonography was conducted. Whenever ileus of the small intestine was suspected, ultrasonographic examinations helped to evaluate the motility, diameter and anatomical arrangements of the small intestine.

Table-1 Per rectal findings of the animals with intestinal disorders

Nature of intestinal disorders	No. of Cows	No. of Bulls	No. of Heifer
Caecal dilatation	2	3	-
Intestinal obstruction/ intussusceptions	9	4	1
Absence of dung in the rectal passage	All the cases		

Table-2 Ultrasonographic dimension of caecum (Mean $\pm$ SE) in animals with caecal dilatation

Bovine	No. of animals	Caecum dilatation Diameter (cm)
Bull	3	4.16 $\pm$ 0.41
Cow	11	3.5 $\pm$ 0.22
Heifer	-	-

Table-3 Ultrasonographic dimension of intestines (Mean $\pm$ SE) in animals with intussusceptions

Bovine	No. of animals	Type of Intussusceptions	Dilated intestinal loop diameter (cm)	Intestinal wall thickness (mm)
Bull	4	Jejunum	3.85 $\pm$ 0.15	2 $\pm$ 0.22
Cow	15	Jejunum & Ileum	4.75 $\pm$ 0.2	3.12 $\pm$ 1.3
Heifer	1	Jejunum	3.7	2.4

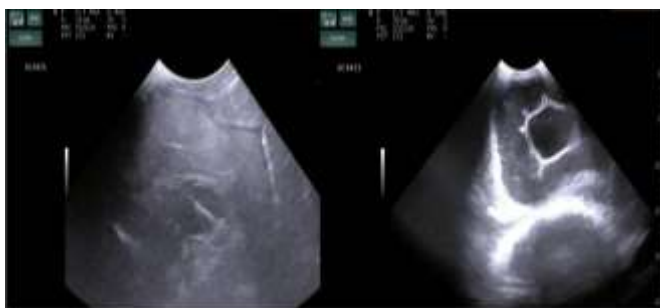


Fig-1 Trans abdominal ultrasonography of an intussusception of the jejunum at mid abdomen. "Bull eye lesion" in a cow 3years, 4month of lactation and 5years of age, 3 month of lactation.



Fig-2 Trans abdominal ultrasonography of intussusception region of ileum at right mid flank reveals dilated multiple loops and "Bull eye lesion" (arrow)



Fig-3 Trans abdominal ultrasonography of pre-intussusception region of jejunum at mid abdomen reveals echogenic contents filled multiple dilated (3 to 5 cm) intestinal loops with swirling movement



Fig-4 Trans abdominal ultrasonography of post-intussusception region of jejunum at mid abdomen reveals multiple gas filled anechoic intestinal loops



Fig-5 Trans abdominal ultrasonography of caecal dialation (arrow) in cow; Diameter >12cm

It also helped to look for evidence of peritonitis and possible causes of ileus [4, 5]. "Bull's eye lesion" is considered the most prominent ultrasonographic finding which is, diagnostic of intussusception either with trans-abdominal or transrectal studies [2]. The same was observed in this study. Dilated intestinal loops greater than 3.1 cm (Mean $\pm$ SE, 4.41 $\pm$ 0.25) were imaged in the lower flank and 12th intercostal space on the right side of 6 Jersey/Red Sindhi cross-bred cows which had intestinal obstruction [6]. Besides "bull eye appearance" of jejunum (Fig.1) and ileum (Fig.2), jejunum has a dilatation of 4.75 $\pm$ 0.2 cm in cross bred cows and 3.85 $\pm$ 0.15 cm in bulls, (Table 2). Intussusception is considered to be the most common cause of intestinal obstruction in Indian cross-bred hill cattle [7]. In this study, the native bulls and cross breed cows which were present in delta plains were equally affected. In previous studies, on ultrasonographic examination of six healthy cattle, it revealed an average jejunum wall thickness of 1.90 mm [1]. In our study dilated jejunal loop wall thickness were greater than 1.90 mm and it ranged between 2 $\pm$ 0.22 and 3.12 $\pm$ 1.3 mm in affected animals. In such cows there were echogenic intestinal contents with swirling movements in the pre-intussusception loops of intestine (Fig.3). Anechoic gas filled multiple intestinal loops were observed in the post-intussusception area (Fig.4). This may occur due to excessive accumulation of fluid, gases and intestinal contents in the lumen of intestinal segments proximal to the site of obstruction. Such findings can also be observed in cases of intestinal ileus and one need to assess carefully and with caution in such cases. Presence of anechoic fluid which was visualized around the loops of the intestine could possibly indicate the presence of chronic peritonitis in affected cattle. It can happen due to the increase in permeability of intestinal wall in severe inflammatory reactions. The present study is in agreement with previous reports, that the presence of dilated multiple loops of intestine in particular area of scanning was also a specific ultrasound evidence for intestinal intussusception [8, 9].

In cattle with caecal dilatation, the caecum was imaged from the right lateral abdominal wall. The wall of the caecum closest to the transducer appeared as a thick, echogenic, semi-circular line [2]. On the right flank, dilated caecum (Fig.5) with echogenic to hyperechoic intestinal contents were visualized and they had the diameter of 3.5 ± 0.22 cm in 11 Cross breed cows and 4.16 ± 0.41 cm in 3 bulls. In all these animals the reticulum appeared as a half-moon-shaped structure with an even contour; but their motility was found to be markedly decreased (1/3min). This is in agreement with the findings of previous studies which stated that the number of reticular contractions was highest during eating (approximately 1.5/min) and lowest when the cows were stressed (a little less than 1.0/min) [2]. The current study highlights that the transabdominal ultrasonography is the ideal tool and has the ability to diagnose intestinal disorders such as intussusceptions, caecal dilatation and also for the confirmation of choric peritonitis in cows and bulls. Trans-abdominal ultrasonography helped for categorisation of the type of intestinal disorders and for further treatment decision making. In addition it served as a client education tool and the farmers appreciated the gravity of the health issues for their cattle and had supported their decision making. Large animal practitioners must increasingly deploy transabdominal ultrasonography for early diagnosis, interventions and decision making in cases with gastrointestinal disturbances.

Summary

Evaluation of 46 cows suspected for complex gastrointestinal disorder resulted in ultrasonographic diagnosis of intestinal disorders in 19 cases. Remaining cases consisted of ruminal impaction, reticular abscess and traumatic reticuloperitonitis were diagnosed with radiography and managed accordingly. Diagnoses in cases with intestinal disorders were made possible by trans-abdominal ultrasonography and it supported by per-rectal palpation to confirm the cases as intestinal intussusceptions and other intestinal disorders.

Application of research: Percutaneous / transabdominal Ultrasonography can be deployed in cows suspected for complex gastrointestinal disorder like intussusceptions.

Research category: Gastrointestinal ruminant medicine, imaging technique

Abbreviations: MHz – megahertz, cm- centimeter, mm – millimeter, SE- standard error, TANUVAS -Tamil Nadu Veterinary and Animal Sciences University

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References

- [1] Munday K. and Mudron P. (2016) *Folia Veterinaria*, 60 (1), 34-40.
- [2] Braun U. (2009) *Veterinary Clinics of North America: Food Animal Practice*,

25 (3), 567-590.

- [3] Rosenberger G. (1979) *Verlag Paul Parey, Berlin and Humber*, pp.14-18.
- [4] Braun U. and Marmier O. (1995) *Veterinary Record*, 136, 239-44.
- [5] Braun U. (1997) *Parey Buchverlag, Berlin*.
- [6] Sheikh Imran, Tyagi S.P., Adarsh Kumar., Amit Kumar., Arvind Sharma and Shivali Sharma. (2011) *Veterinary Medicine International*, 1-6.
- [7] Kumar A. (2006) *Ph.D. thesis, CSK Himachal Pradesh Krishi Vishvavidyalaya, Himachal Pradesh, India*.
- [8] Braun U., Marmier O. and Pusterla N. (1995) *The Veterinary Record*, 137(9), 209-215.
- [9] Pravettoni D., Morandi N. and Rondena M. (2009) *Canadian Veterinary Journal*, 50 (3), 287-290.