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Research Paper

MULTIFUNCTIONAL FORESTOMACH DIORDERS IN BOVINE

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Buffaloes and cows play an important role in economy of the farmer and these animals are mainly reared for milk production. Any problem in digestive system of the animals amounts to high economic loss to farmers. In digestive system, reticulum is the organ that is mainly affected and the disorders like traumatic reticuloperitonitis, omasal impaction, abomasal impaction and diffuse peritonitis and metallic foreign bodies in the reticulum are common in Indian feeding practices. Multifunctional disorders included two cattle and nine buffaloes and all of them were adult females with mean age of (range 3-10 yrs). The various conditions included under the multifunctional forestomach disorders have been reported to occur in adults animals. The finding that more number of female buffaloes suffered from multifunctional disorders may be attributed to more prevalence of female buffaloes in the region.

Keywords: Forestomach diorders, Multifunctional disorder, Boviner

CASE HISTORY

The animal suffering from reticulophrenic adhesions (n=15) had vague history of complete anorexia (n=9) or partial anorexia (n=6). The anorexia might be a result of altered reticular motility due to perireticular adhesions. All the animals suffering from omasal impaction, diffuse peritonitis and multifunctional disorders showed complete anorexia.

Animals of all the groups were fed on wheat straw, green grass and grain in varying concentrations. Interestingly, all the animals of group 4 suffering from omasal impaction were

fed with machine made wheat straw which is very fine variety of wheat straw. It can be hypothesized that because of fine texture, the feed might have got entrapped in between the omasal leaves leading to omasal impaction which might have reduced the gastrointestinal tract motility with increased omasal pressure resulting from omasal impaction. Earlier studies have also implicated the finely cut wheat straw as a possible cause of omasal impaction (Toor, 2003; and Brar, 2004). Sudden change in diet was not reported in animals of any group.

Animal showed either scanty defecation or complete cessation of feces which may be due

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to involvement of the forestomach, perireticular adhesions and reduced GIT motility due to diffuse peritonitis.

Regurgitation was observed in very few animals suffering from various reticular disorders. However regurgitation was recorded. This could be attributed to inability of ingesta to pass further down the digestive tract due to reticular/omasal malfunction and involvement of vagus (Leek, 1969). This may also be associated with disfunction of low threshold receptors and fibrosis of wall of reticulum with no involvement of vagus (Behl and Krishnamurthy, 1996). Animals were in either lactation, recently parturated or were in advanced pregnancy. The pregnancy status however could not be related to the disease in any of these groups. Pain was not recorded in majority of the animals. However some amount of pain evidenced by flinching on palpation, looking at the flank, frequently getting up and getting down was observed in animals suffering from multifunctional disorders. Pain observed in these animals may due presence of matellic foreign bodies.

Rumination was suspended in majority of animals suffering from multifunctional disorders. Animals showed hypermotile rumen. Recurrent tympany was observed in 7 animals from multifunctional disorders, while it was absent in 4 animals. The rumen pH was slightly acidic. This may be attributed to abomasal reflux associated with the forestomach disorders. This was consistent to findings of Toor (2003) in cases of reticular abscess and omasal impaction. The protozoal was absent in majority of animals suffering from multifunctional disorders. This may be due to stagnation of GIT contents and indiscriminate antibiotic therapy prior to presentation of case. The animals were in general

alert and had wet muzzle. However, three animals which showed dry muzzle and had moderate degree of dehydration suffered from omasal and abomasal impaction. The rectal temperature, heart rate and respiration rate at time of presentation were within normal physiological limit. This was in accordance to the earlier finding of Behl *et al.* (1997), Toor (2003) and Brar (2004).

RESULTS AND DISCUSSION

Blood parameters showed elevated TLC, with neutrophilia with and consequent lymphopenia were recorded. These findings were in concurrence with Blood *et al.* (1989). Coles (1974) and Singh (2002) suggested that the increase in TLC and neutrophilia associated with lymphopenia might be in response to stress. In these groups the haemoglobin and packed cell volume were within normal range.

In animals total plasma protein was observed which may be attributed to increase in globulin fractions due to inflammatory process in the body (Fubini *et al.*, 1989), dehydration and infection. In general, the total plasma protein was elevated in animals which may be fair indicator of the disease process alongwith dehydration. Hypoalbuminia was record. This may be secondary to sequestration of protein into extravascular, i.e., hepatic failure, malnutrition, malabsorption, maldigestion and inflammatory response (Jain, 1986). The plasma fibrinogen remained within normal range.

The animals showed normal to slightly elevated plasma calcium levels. This was consistent to findings of Avery *et al.* (1986) who reported no change in plasma calcium levels in various digestive disorders. The plasma sodium values were recorded to be lower than normal. These finding were consistent to those recorded by

earlier workers (Toor, 2003; and Brar, 2004). The plasma potassium values were within normal range. This was in contrast to findings of earlier worker who reported lower potassium levels in these disorders (Sobti *et al.*, 1982; and Tagra *et al.*, 2001; Toor, 2003 and Brar, 2004). The plasma chloride levels were recorded to be normal. The rumen chloride was recorded to be higher than normal reported values which may give a fair indication of the abomasal reflux. However, rumen chloride did not appear diagnostic in any of the combination. In contrast, Behl *et al.* (1997), Toor (2003) and Brar (2004) reported reduced chloride values in forestomach disorders in bovines.

Radiograph

Survey radiographs were not helpful in diagnosis. However metallic foreign bodies in the reticulum could be visualised on radiographs.

Ultrasound

The reticulum was scanned at 7th intercostal space starting from the level of right elbow slowly scanning down to the ventral midline with crescent shaped 3-5 Mhz transducer. The reticular wall was evident as a typical crescent shaped structure having a smooth contour (Braun *et al.*, 1993b; Braun and Gotz, 1994; and Braun, 2003) or undulating wall. However, the biphasic reticular contractions were not seen and the reticular motility was recorded as nil all the animals. At times, the reticular wall appeared to move along with each respiration thereby giving a fair indication of reticulophrenic adhesions. The reticular wall in real time B-mode appeared to slide along the skin and muscle layers and at no time the reticulum contracted away from the transducers. These features strongly suggested reticulophrenic adhesions which was confirmed

upon exploratory laparo-rumenotomy. Similar ultrasonographic features have been reported by Braun *et al.* (1994) and Braun (2003) who stated that in cases of traumatic reticuloperitonitis the frequency.

Accumulation of Fluid with Fibrinous Adhesions: Diffuse Peritonitis (Ultrasonography)

Diffuse peritonitis was visible ultrasonographically as accumulation of fluid with or without fibrinous adhesions covering the entire peri-reticular area and at times involving the whole peritoneal cavity. Depending on fibrin or cell contents of the fluid the echotexture was anechoic to hypo-echogenic. Sometimes bands of fibrin were seen within the peritoneal effusion (42). Similar findings have been reported in cases of peritoneal effusions and diffuse peritonitis by Braun *et al.* 1994 and Braun *et al.* 2003. Ultrasound guided abdominocentesis was done in all the animals and diffuse peritonitis was confirmed. Ultrasound was found to be reliable in diagnosis of diffuse peritonitis.

Intra-Operative

The intra-operative finding in animals suffering from multifunctional disorders/multi-organ involvement (n=11), exploratory laparotomy revealed rumen adhesions in for cases. The rumen contents were semi-solid (n=4) or impacted (n=4), in general, which suggested generalised atony. However, in three animals the rumen contents were watery. Reticular adhesions were recorded in nine animals which confirmed the ultrasonographic findings of reticulophrenic adhesion in eight cases. Potentially penetrating or non penetrating metallic foreign bodies were recorded in six animals. The increase in peritoneal fluid was recorded upon laparotomy in eight animals. This again confirmed

Figure: Ultra Sonography



the ultrasonographic findings of increased peritoneal fluid recorded prior to laparorumenotomy. The omasum was impacted in two cases while in one case abomasums was impacted. In one animal both omasum and abomasums were impacted while in another animal omasum and abomasums were distended but not impacted which suggested generalised atony and gastrointestinal stasis.

Surgical Management

In animal suffering from multifunctional disorders the individual disorders like omasal impaction/ abomasal impaction/rumen impaction were corrected upon laparo-rumenotomy. In case of rumen impaction the rumen was evacuated and

filled with one third of water before closing the rumen. The cases of omasal impaction were treated as described above. The cases of abomasum distention/impaction were treated by passing small diameter tube through reticulo-omasal orifice into the abomasums and flushing with high pressure tap water. After abomasums reduced to normal size, two litres of mineral oil was passed into the abomasums through same pipe. Majority of animals were relieved by surgical treatment and were discharged after two day follow up. 🌀

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