A Clinical Study of Rumen Impaction in Bovines and its Therapeutic Management with Metoclopramide – A Report of Six Cases

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Abstract
The aim of the study was to find out the prokinetic effect of metoclopramide in clinical cases of bovine rumen impaction caused due to dietary disturbances. Six Hallikar bullocks with history of anorexia and suspended ruminations were selected for the study. Although with normal vital signs, clinical examination of left paralumbar fossa revealed depressed rumen motility with a firm to hard rumen. A small and hard rumen were observed upon rectal examination. Rumen fluid examination showed a pH of 5.5-6.0 with reduced protozoal activity. The clinical cases were diagnosed as rumen impaction and were treated successfully with Inj. Metoclopramide, fluids and Vitamin B-complex injections.

Introduction
Rumen impaction results from the accumulation of the indigestible materials in the rumen which interferes with the flow of ingesta leading to distension of the rumen and passing of scanty or no feces (Smith, 2009 and Abdullahi et al., 1984). It is characterized by dense packing of rumen with indigestible roughage accompanied by rumen hypomotility, anorexia and reduced fecal output. Rumen impaction is mainly caused due to a dietary error with a slight increase in ruminal acidity or alkalinity (Smith, 2009). The literature on prokinetic effect of metoclopramide on the rumen and reticulum of adult cattle is scant (El-Khodery and Sato, 2008)

History and Diagnosis
Six Hallikar bullocks, aged about 8-9 years were presented with history of anorexia and suspended ruminations. Further enquiry revealed that the bullocks were fed with 8-10 kg of feed mixture consisting of tapioca flour, Bengal gram husk, rice bran, toor dhal, green gram and ad libitum quantities of late cut straw (lignified straw) with restricted access to water. The entire ration was fed to animals only at evening hours.

Clinical examination of the left paralumbar fossa in two bullocks failed to identify a normal rumen pack with absence of rumen movements and a sense of emptiness in which nothing but the abdominal wall could be felt (Radostitis et al., 2000). A firm to hard content was felt in the rest of the bullocks. The rectal temperature ranged from 38.3-38.5°C, with a mean pulse and respiratory rate of 67/min and 33/min respectively (Table-1). Rectal examination revealed a small and hard rumen in all the animals. The faeces were scanty and tenacious and almost completely absent up to the descending colon in four of the bullocks and the rectal mucosa was dry and rough. Rumen fluid examination revealed a mean rumen pH of 5.5-6.0 in four of the bullocks. Rumen fluid could not be collected in bullock 3 and 4 with rumen atony (Table-1). The colour of the rumen fluid was yellow brown and more viscous with greatly reduced protozoal activity (Table-1). The animals were diagnosed as rumen impaction due to dietary disturbances. There were no appreciable changes in haematology except for a mild increase in the mean PCV value of 47.8 percent attributed to dehydration (Smith et al., 2009).

Treatment
All the animals were treated with Inj. Metoclopramide @ 0.5 mg/kg b.wt i.m (Inj. Reglan®) for the first three days. The bullocks were treated with Inj. Dextrose Normal Saline (DNS) @ 20ml/kg b.wt i.v and Inj. Vit. B₁ + B₆ + B₁₂ 10 ml i.m (Inj. Tribivet®) per animal as supportive therapy. The rumen consistency became doughy, with

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1. Ph.D Scholar
a - Brand of CFL Pharma Ltd., Mumbai
b - Brand of Intas Animal Health, Ahmedabad
Rumen Impaction in Bovines

Table 1: Effect of metoclopramide in bullocks with rumen impaction

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Bullock 1</th>
<th>Bullock 2</th>
<th>Bullock 3</th>
<th>Bullock 4</th>
<th>Bullock 5</th>
<th>Bullock 6</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-treat</td>
<td>Post-treat</td>
<td>Pre-treat</td>
<td>Post-treat</td>
<td>Pre-treat</td>
<td>Post-treat</td>
<td>Pre-treat</td>
</tr>
<tr>
<td>Rectal temperature (°C)</td>
<td>38.0</td>
<td>38.2</td>
<td>38.3</td>
<td>38.5</td>
<td>38.2</td>
<td>38.3</td>
<td>38.0</td>
</tr>
<tr>
<td>Pulse (bpm)</td>
<td>64</td>
<td>60</td>
<td>62</td>
<td>67</td>
<td>69</td>
<td>68</td>
<td>72</td>
</tr>
<tr>
<td>Respiration (rate/min)</td>
<td>36</td>
<td>33</td>
<td>24</td>
<td>26</td>
<td>42</td>
<td>39</td>
<td>29</td>
</tr>
<tr>
<td>Rumen consistency</td>
<td>firm</td>
<td>dough</td>
<td>hard</td>
<td>doughy</td>
<td>hard</td>
<td>firm</td>
<td>doughy</td>
</tr>
<tr>
<td>Rumen motility/5min</td>
<td>2</td>
<td>6</td>
<td>3</td>
<td>5</td>
<td>Nil (atonic)</td>
<td>4</td>
<td>Nil (atonic)</td>
</tr>
<tr>
<td>pH(range)</td>
<td>5.5-6.0</td>
<td>6.5-7.0</td>
<td>5.5-6.0</td>
<td>6.0-6.5</td>
<td>*</td>
<td>5-5.5</td>
<td>*</td>
</tr>
<tr>
<td>Protozoal motility</td>
<td>+</td>
<td>++</td>
<td>Nil</td>
<td>+++</td>
<td>*</td>
<td>+</td>
<td>*</td>
</tr>
</tbody>
</table>

Increased rumen motility from a mean of 1.8 to 5.5. There was easy passage of dung in all affected bullocks and with increased protozoal motility of rumen fluid (Table-1).

Discussion

An effective prokinetic drug must be able to induce stomach motility in a coordinated sequence of contractions and relaxation of sphincter. A wide variety of drugs have been used for many years to induce stomach motility but with little success. Rumenotronics containing nuxvomica, ginger and tartar given orally have not been found effective. Parasympathomimetics such as neostigmine or carbamyl choline should not be used to treat stomach atony as the drugs require effective vagal activity and therefore cannot incite normal primary contractions in atonic animals. Neostigmine alters the strength of primary contraction without altering the rhythm or coordination (Radositis et al., 2009).

Stafford and Leek (1988) and Bueno et al. (1983) observed that metoclopramide could block the effect of dopamine peripherally increasing the amplitude and rate of the reticulo-rumen contraction in sheep. Experimentally metoclopramide increase the rate of ruminal contraction and might be beneficial in rumen hypomotility. (Radositis et al., 2009). Metoclopramide increased the amplitude and frequency of contraction, but only for 20 minutes and only at a dose rate of 0.3 mg/kg i.m. (Huhn and Nelson, 1997). El-Khodery and Sato (2008) suggested that metoclopramide at 0.3 mg/kg could produce mild and transient prokinetic effect. No untoward side effects were recorded in the present study that concurred with the findings of Huhn et al. (1992).

Conclusion

Rumen impaction in bullocks was mainly caused due to dietary error. Anorexia, suspended rumination, firm to hard rumen, reduced rumen pH (5.5-6.0) and reduced fecal output were observed. Administration of metoclopramide @ 0.5 mg/kg b.wt along with fluids and vitamins helped in relieving rumen impaction in bullocks.

References

Impaction of rumen with indigestible garbage in cattle and sheep reared within urban and suburban environment. *Nig. Vet. J.* 13: 89-95


