

Clinical findings and treatment in 63 cows with haemorrhagic bowel syndrome

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Summary

The clinical, haematological and biochemical findings, treatment and outcome of 63 cows with haemorrhagic bowel syndrome are described. The general condition and demeanour were moderately to severely abnormal in all the cows. Signs of colic occurred in 27 cows, decreased rectal temperature in 46 and tachycardia in 44. With the exception of one cow, intestinal motility was decreased or absent. Transrectal palpation revealed dilatation of the rumen in 47 cows and dilatation of the small intestine in 18. Faecal output was markedly reduced or absent, and the faeces were dark brown to black and contained blood. Nine cows were euthanased immediately after physical examination. Conservative medical therapy was instituted in two cows; however, both were euthanased a few days later because of deterioration in condition. Exploratory right flank laparotomy was carried out in 52 cows. Of these, 22 were euthanased intraoperatively because of severe lesions. In 27 cows, intestinal massage to reduce the size of blood clots was carried out; 11 were euthanased several days postoperatively because of deterioration in condition. In three other cows, intestinal resection was carried out and all survived. Of the 63 cows, 19 (30.2%) survived and were healthy at the time of discharge from the clinic.

Keywords: cattle, haemorrhagic bowel syndrome, clinical findings, haematology, biochemistry, treatment

Klinische Befunde und Therapie bei 63 Kühen mit Haemorrhagic Bowel Syndrome

In der vorliegenden Arbeit werden die klinischen, hämatologischen und biochemischen Befunde sowie die Therapie von 63 Kühen mit Haemorrhagic Bowel Syndrome beschrieben. Das Allgemeinbefinden war bei allen Kühen mittel- bis hochgradig gestört. 27 Kühe wiesen Kolik auf. Bei 46 Kühen wurden rektal Untertemperatur und bei 44 Kühen Tachykardie festgestellt. Die Darmmotorik war, von einer Ausnahme abgesehen, bei allen Kühen reduziert oder aufgehoben. Bei der rektalen Untersuchung wiesen 47 Kühe einen dilatierten Pansen und 18 Kühe dilatierte Dünndärme auf. Der Kotabsatz war stark vermindert oder fehlend und der Kot war dunkel bis schwarz und bluthaltig. Neun Kühe wurden unmittelbar nach der Untersuchung euthanasiert. Bei 2 Kühen wurde eine rein medikamentöse Therapie durchgeführt. Beide mussten am folgenden Tag wegen weiterer Verschlechterung euthanasiert werden. Bei 52 Kühen wurde in der rechten Flanke eine Laparotomie durchgeführt. Davon mussten 22 wegen hochgradiger Veränderungen intra operationem euthanasiert werden. Bei 27 Kühen wurde eine Darmmassage durchgeführt. Davon mussten 11 Kühe an den folgenden Tagen euthanasiert werden. Bei weiteren 3 Kühen, die alle überlebten, wurde eine Darmresektion durchgeführt. Insgesamt wurden 19 von 63 Kühen (30.2%) gesund entlassen.

Schlüsselwörter: Rind, Haemorrhagic Bowel Syndrome, klinische Befunde, Blutbefunde, Behandlung

Introduction

Haemorrhagic Bowel Syndrome (HBS) in cattle is an acute disease of the jejunum, which manifests clinically as ileus and is usually fatal (Berghaus et al., 2005). It is characterised by segmental necrohaemorrhagic inflammation of the small intestine, in which large intralu-

menal blood clots and sloughed mucosa result in mechanical obstruction of a varying length of the jejunum (Abutarbush and Radostits, 2005). There appears to be a higher incidence of HBS in Brown Swiss cows than other breeds of cattle (Peek et al., 2009). The most important clinical findings include signs of ileus, such as colic, melena and dilatation of the abdomen (Dennison et al.,

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2002; Abutarbush and Radostits, 2005; Ceci et al., 2006). Faecal output is usually markedly reduced, and the faeces are dark red to black or contain blood clots (Dennison et al., 2002). The sonographic findings in cows with HBS have been described (Dennison et al., 2002; Braun et al., 2010) and typically include dilated non-motile loops of intestine. Echoic material corresponding to blood clots can be seen in 19 to 25 per cent of cows (Dennison et al., 2002; Braun et al., 2010), and fluid can often be seen between dilated loops of intestine (Braun et al., 2010). Affected cattle are treated medically or surgically. The latter involves right flank laparotomy (Dennison et al., 2002; Peek et al., 2009) and manual massage of the intestine to reduce the size of the blood clots. Enterotomy with removal of the blood clots and resection of the necrotic intestine is another option. In addition to these measures, Anderson and Ewoldt (2005) recommended rigorous multimodal analgesic therapy using a combination of flunixin, torbugesic and lidocaine. The outcome of various surgical treatments was recently reviewed; cows that underwent manual massage of the intestine without enterotomy had a significantly higher short-term survival rate than cows that underwent intestinal resection (Peek et al., 2009). Published reports on HBS include the findings in one cow (Rademacher, 2001), 11 cows (Abutarbush and Radostits, 2005; Ceci et al., 2006), 22 cows (Dennison et al., 2002) and 31 cows (Peek et al., 2009). The goal of the present study was to describe the clinical, haematological and biochemical findings as well as treatment and outcome in a large number of cows with HBS and compare the results with those of other studies.

Animals, Material and Methods

Animals

The study used 63 cows with HBS, which were referred to the Department of Farm Animals, University of Zurich, between January 1, 2004 and December 31, 2008. The cows originated from 63 farms with an average milk yield between 5900 and 8200 kg per cow. There were 59 Swiss Braunvieh, two Simmental and two Holstein-Friesian cows, which ranged in age from two to 10 years (mean \pm sd = 5.1 \pm 2.06 years). All but one of the Swiss Braunvieh cows were crossbred with Brown Swiss. Thirty-two of the cows had calved two to 35 weeks (14.3 \pm 8.45 weeks) before becoming ill. Fifteen cows were six to 31 weeks pregnant (12.8 \pm 8.03 weeks). In the remaining 16 cows the date of calving was unknown. The cows were referred because of acute onset of severe illness, anorexia and absence or marked reduction of faecal output. Signs of colic were also frequently seen. The cows had been ill 1.22 \pm 0.55 days before referral. The length of illness was six to 24 hours in 50 cows, 48 hours in 12 and 96 hours in one cow.

Clinical examination

The cows underwent a thorough clinical examination (Rosenberger, 1979) before ultrasonography. In 55 cows, a urine sample was evaluated macroscopically and using a urine test strip (Combur⁹-Test, Roche, Basle, Switzerland) and the urine specific gravity was determined. A ruminal fluid sample was obtained via stomach tube in 55 cows; the macroscopic appearance, pH, chloride concentration and methylene blue reduction time were determined. All cows underwent abdominal ultrasonography, the results of which have been reported (Braun et al., 2010).

Haematological and biochemical analyses

Haematological and biochemical analyses were undertaken in 62 cows. The haematocrit, total leukocyte count and concentrations of total protein and fibrinogen were determined in EDTA blood. The concentrations of bilirubin, urea, calcium, inorganic phosphorus, magnesium, sodium, chloride and potassium, and the activities of γ -glutamyl transferase (g-GT) and aspartate aminotransferase (ASAT) were determined in serum using a Cobas Integra 700 analyzer (Roche Diagnostics) and Roche reagents under conditions defined by the International Federation of Clinical Chemists at 37 °C. Blood gas analysis was carried out on a jugular venous blood sample.

Diagnosis

A diagnosis of HBS was based on intraoperative findings in operated cows that survived and on postmortem findings in cows that were euthanased. These findings included a dark red dilated jejunum with intraluminal blood clots (Dennison et al., 2002; Abutarbush and Radostits, 2005; Ceci et al., 2006; Peek et al., 2009).

Treatment

After examination, the cows were euthanased or treated medically or surgically. Medical treatment consisted of 10 l of a sodium chloride and glucose solution (50 g glucose and 9 g sodium chloride/litre) administered intravenously over 24 hours via an indwelling jugular venous catheter. The cows also received 5 l of a sodium chloride and glucose solution with the addition of 42.5 mg neostigmine (Konstigmin, Vétuquinol, Ittigen, Switzerland), and 500 ml of 40% calcium borogluconate solution with the addition of 6% magnesium hypophosphite (Calcmyl-40 MP, Graeub, Berne, Switzerland), administered as an intravenous drip. Animals with clinical indications of visceral pain were given 30 mg/kg metamizole (Vetalgin, Veterinaria, Zurich, Switzerland), intravenously. Electrolyte imbalances were corrected.

For surgical treatment, a proximal paravertebral local block using 100 to 200 ml lidocaine (Lidocain 2% Chas-

sot, Vétoquinol) was carried out, and a 25 cm incision was made in the right flank approximately 10 cm ventral to the transverse processes of the lumbar vertebrae and parallel to the last rib. The abdomen was explored, and an intraoperative diagnosis of HBS was made when the small intestine was dilated, dark red to black and obstructed with blood clots without ileus attributable to intussusception, strangulation, volvulus, incarceration, compression of the intestine or ileal impaction. In three cows with severe damage to the intestinal wall, a 0.30, 0.40 and 2.50 m section of jejunum was resected. In the remaining cows, the intestine was carefully massaged to reduce the size of the blood clots and move them distally. The operated cows received the same medical treatment as cows treated conservatively but in addition were given 27×10^6 IU procaine penicillin (Benzylpenicillinum procainum, Intervet), intramuscularly, and 500 mg flunixin meglumine (Finadyne, Berna, Berne, Switzerland), intravenously, for three days.

Euthanasia and postmortem examination

Cows that were euthanased immediately after clinical examination, intraoperatively or postoperatively underwent postmortem examination at the Institute of Veterinary Pathology, University of Zurich. These data will be published separately.

Statistical analysis

Statistical calculations were carried out using the calculation program SPSS Statistics Version 17.0. Frequencies, means and standard deviations of various variables were calculated. The results of the parameters investigated were with exception of the methylene blue test normally distributed. Differences between euthanased and healthy discharged cows with respect to variables listed in tables 1 to 6 were analysed using analysis of variance (ANOVA) and *t*-test (continuous data) or ANOVA and chi-square test for association (frequency distribution of categorical data).

Results

Clinical findings

The general condition and demeanour were moderately abnormal in 24 cows and severely abnormal in 39. Two cows were down at the time of admission. Appetite was markedly reduced or absent. In 27 cows, signs of colic occurred, which included shifting of weight from one foot to another ($n = 18$), spontaneous sinking of the back ($n = 8$) and going down during examination ($n = 1$). Sunken eyeballs, reduced skin turgor, dry muzzle, drooping

Table 1 : Gastrointestinal findings in 63 cows with haemorrhagic bowel syndrome.

Variable	Finding	Number of cows
Rumen motility	Normal	0
	Decreased	26
	Absent	37
Foreign body tests ($n = 61$)	All tests negative	49
	Back grip positive ¹	5
	Pole test positive ¹	3
	Two or three tests positive	4
Intestinal motility	Normal	1
	Decreased	48
	Absent	14
Swinging and percussion auscultation on the left side	Both negative (normal)	61
	Percussion auscultation positive	1
	Swinging auscultation positive	1
Swinging and percussion auscultation on the right side	Both negative (normal)	9
	Both positive	38
	Swinging auscultation positive	16
Rectal findings (more than one abnormal finding in some cattle)	Normal findings	16
	Rumen dilated	47
	Small intestine dilated	18
	Small intestine empty	17

¹Elicited a grunt in at least 3 of 4 tests

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ears, uraemic breath, muscle tremors, starry hair coat, bruxism, spontaneous grunting and sweating were additional signs. The rectal temperature ranged from 36.0 to 39.3°C ($38.0 \pm 0.70^\circ\text{C}$) and was lower than normal ($38.5\text{--}39.0^\circ\text{C}$) in 46 cows and slightly higher than normal in four. The heart rate ranged from 56 to 176 bpm (91 ± 22 bpm) and was lower than normal (60–80 bpm)

in three cows and higher than normal in 44. Fifty-nine cows had scleral injection. The oral mucous membranes were pale in 21 cows. The respiratory rate varied from 14 to 44 breaths per minute (24 ± 7.5 breaths per minute) and was lower than normal in 15 cows (< 20 breaths per minute) and higher than normal in 12 (> 40 breaths per minute).

Table 2: Results of haematological, biochemical and venous blood gas analyses in 62 cows with haemorrhagic bowel syndrome.

Variable (Mean \pm sd)	Finding	Number of cows
Haematological variables		
Haematocrit ($32.5 \pm 5.4\%$)	Normal (27–35 %)	37
	Decreased (17–26%)	8
	Increased (36–45 %)	17
Total leukocyte count ($10980 \pm 4244/\mu\text{l}$)	Normal (4000– 10^3 000/ μl)	25
	Decreased (2500/ μl)	1
	Increased (10^3 300– 26^3 300/ μl)	36
Total protein (81.5 ± 10.9 g/l)	Normal (61–80 g/l)	24
	Decreased (50–60 g/l)	2
	Increased (81–106 g/l)	36
Fibrinogen (6.2 ± 1.9 g/l)	Normal (4–6 g/l)	41
	Decreased (3 g/l)	2
	Increased (7–10 g/l)	19
Biochemical variables		
Bilirubin (3.0 ± 1.8 $\mu\text{mol/l}$)	Normal (1.0–8.5 $\mu\text{mol/l}$)	61
	Increased (9.5 $\mu\text{mol/l}$)	1
Urea (13.1 ± 5.7 mmol/l)	Normal (3.0–7.5 mmol/l)	8
	Increased (7.6–27.1 mmol/l)	54
Calcium (1.93 ± 0.66 mmol/l)	Normal (2.00–2.60 mmol/l)	16
	Decreased (0.49–1.99 mmol/l)	40
	Increased (2.65–4.07 mmol/l)	6
Inorganic phosphorus (2.03 ± 0.57 mmol/l)	Normal (1.40–2.30 mmol/l)	37
	Decreased (0.84–13.5 mmol/l)	8
	Increased (2.33–3.79 mmol/l)	17
Magnesium (1.43 ± 0.46 mmol/l)	Normal (0.80–1.00 mmol/l)	7
	Increased (1.01–3.98 mmol/l)	55
Sodium (142.7 ± 4.19 mmol/l)	Normal (145–155 mmol/l)	19
	Decreased (131–144 mmol/l)	42
	Increased (> 155 mmol/l)	1
Chloride (80.7 ± 8.9 mmol/l)	Normal (96–105 mmol/l)	0
	Decreased (57–95 mmol/l)	62
Potassium (2.7 ± 0.6 mmol/l)	Normal (3.5–4.9 mmol/l)	9
	Decreased (1.8–3.4 mmol/l)	53
γ -GT (30.2 ± 28.5 U/l)	Normal (12–20 U/l)	10
	Increased (21–122 mmol/l)	52
ASAT (114.0 ± 40.0 U/l)	Normal (65–80 U/l)	9
	Increased (83–254 U/l)	53

Eleven cows had marked abdominal dilatation, and 45 cows had a tense abdominal wall. Ruminal motility was reduced or absent in all the cows (Tab. 1). The rumen was fuller than normal in 40 cows, and there was mild to moderate tympany in three cows. One or more reticular foreign body tests were positive in 12 cows, and, on auscultation of the right flank, intestinal motility was severely reduced or absent in all but one cow. Swinging auscultation and percussion auscultation were positive on the right side in 54 cows. Transrectal palpation revealed dilatation of the rumen in 47 cows, dilated small intestine in 18 and empty loops of small intestine in 17. The intestines could not be palpated per rectum in the remaining cows.

The amount of faeces in the rectum was normal in only one cow and markedly decreased or absent in the remainder. The colour of the faeces was normal in 11 of 51 cows with faeces in the rectum. The remaining 40 cows had dark brownish-red or black faeces. In 40 cows, the faeces contained blood, mucus or fibrin, and in eight they were poorly digested and contained large particles. The consistency of the faeces was abnormal and pasty, thick porridge-like, soupy or watery in 36 cows.

Laboratory findings

The colour of ruminal fluid samples was normal in all the cows, and the pH ranged from 6.0 to 9.0 (7.68 ± 0.61) in 55. The methylene blue reduction test was normal at up to 6 minutes in five cows, but was delayed in the remainder. The concentration of chloride varied from 14 to 59 mmol/l (27.1 ± 9.30 mmol/l) and was normal (14–25 mmol/l) in 27 cows and elevated (26–59 mmol/l) in 26. Urine pH ranged from 5.0 to 9.0 (7.72 ± 1.27) and was lower than normal (5.1–6.5) in 15 cows. The specific gravity was 1015 to 1050 (1029 ± 7.83) and was lower than normal (1015–1019) in five cows and higher than normal (1041–1050) in four. There was, obvious by the sticks, haematuria or haemoglobinuria in 34 cows, glucosuria in 25, proteinuria in 25 and mild ketonuria in one. The most common haematological abnormalities were higher than normal total protein concentration (n = 36)

and neutrophilia (n = 36) (Tab. 2). The most common biochemical abnormalities were hypochloraemia (n = 62), hypermagnesaemia (n = 55), azotaemia (n = 54), hypokalaemia (n = 53), hyponatraemia (n = 42) and hypocalcaemia (n = 40). The activities of ASAT and γ -GT were higher than normal in 53 and 52 cows, respectively. Blood gas analysis revealed non-compensated metabolic alkalosis with an increased blood pH (7.50–7.55) in 13 cows. Compensated metabolic alkalosis with an increased base excess (2.2 to 25.3 mmol/l) but normal blood pH (7.35 to 7.48) occurred in 34 cows.

Outcome

Nine cows were euthanased immediately after the clinical examination because they were down (n = 2) or the owners elected euthanasia because of a poor prognosis (n = 7) (Tab. 3). The owners of two other cows elected conservative treatment with intravenous saline and glucose solution, neostigmine, calcium borogluconate and metamizole. Neostigmine was justified because both cows were still passing manure, albeit small amounts. However, both cows were euthanased the following day because of deterioration of condition. Of 52 cows that underwent surgical treatment, 22 were euthanased because of severe lesions, including intestinal wall necrosis, obstruction of several metres of intestine, inaccessibility of the obstructed proximal jejunum or peritonitis. Of 27 cows that underwent intestinal massage, 11 were euthanased one to eight days postoperatively because of deterioration of condition or recurrence of ileus. Sixteen cows were healthy at the time of discharge four to seven days postoperatively. Three cows underwent intestinal resection and were healthy at the time of discharge. A total of 19 of 63 (30.2%) cows survived.

Comparison of euthanased and surviving cows

None of the means or frequency distributions of the variables differed significantly between the 19 cows that survived and the 44 that were euthanased.

Table 3: Treatment and outcome in 63 cows with haemorrhagic bowel syndrome.

Treatment	Therapeutic details	Outcome	
		Euthanasia immediately after examination or during the subsequent few days (n = 44)	Healthy at discharge (n = 19)
None (n = 9)	Euthanasia after physical examination (n = 9)	9	0
Conservative (n = 2)	Medical treatment (n = 2)	2	0
Surgery (n = 52)	Euthanasia intraoperatively (n = 22)	22	0
	Intestinal massage (n = 27)	11	16
	Intestinal resection (n = 3)	0	3

Discussion

Many of the cows appeared severely ill at the time of admission with marked abnormalities in general condition and demeanour, sunken eyes and a dry muzzle. It was immediately evident that the cows were in critical condition, even before a diagnosis had been made. The most important signs characteristic of HBS were intestinal atony, reduced faecal output and melaena. Similar findings have been reported in other studies of HBS (Dennison et al., 2002; Abutarbush and Radostits, 2005; Ceci et al., 2006). Although colic is typical of ileus, it was seen in only 27 cows (43%). This is in agreement with other studies in which abdominal pain was reported in 36% (Ceci et al., 2006) and 37% (Abutarbush and Radostits, 2005) of cows with HBS. Colic was also not a lead sign in other types of ileus, such as intussusception of the jejunum (Dirksen, 2002). It seems that cattle show signs of abdominal pain discretely and that acute signs of colic resolve within a few hours. Bovine colic usually lasts two to six hours and a maximum of 12 hours (Gründer, 1984). It is followed by a stage of indolence lasting several days and finally a stage of intoxication. Cows are very quiet to apathetic in the stage of indolence and their general condition and demeanour are severely abnormal. The ileus in our patients was caused by obstruction, which may have contributed to the relatively low frequency of colic. Thus, it is important to note that absence of colic does not denote absence of ileus. Many of the cows had decreased rectal temperature with associated tachycardia, enophthalmus, reduced skin turgor and uraemic breath, which were indications of shock caused by HBS. In more than 50 per cent of the cows these signs were also the result of abomasal reflux syndrome with hypochlorhaemic metabolic alkalosis as evidenced by elevated ruminal chloride concentration, hypochlorhaemia, hypokalaemia, metabolic alkalosis and azotaemia (Radostits et al., 2007a). Hypocalcaemia seen in 40 cows was probably caused by intestinal atony with no or reduced resorption of calcium. Reduced glomerular filtration resulted in prerenal azotaemia and hyperphosphataemia. Hyponatraemia could also have resulted from proximal tubular dysfunction (Radostits et al., 2007a). However, it was not known why 55 cows had hypermagnesaemia. It could be related to previous calcium and magnesium infusions by the referring veterinarians or to renal insufficiency.

The differential diagnosis for the cows in our study included bleeding abomasal ulcer, abomasal volvulus and intussusception of the jejunum. With bleeding abomasal ulcer, the faeces are black but rarely reduced in amount (Braun et al., 1991) and the haematocrit is lower than normal. In our patients the haematocrit was normal or elevated. Determination of haematocrit can therefore be an important diagnostic tool: a value less than 16 per cent, which often occurs in bleeding abomasal ulcer (Braun et al., 1991), has not been described in cows with HBS. Haematocrits were reported to range from 29 to 53

per cent (mean 40%) by Dennison et al. (2002) and from 16 to 28 per cent (mean 24%) by Abutarbush and Radostits (2005). In cattle with abomasal volvulus, swinging auscultation and percussion auscultation are strongly positive on the right side. Transrectal palpation often reveals a dilated abomasum (Radostits et al., 2007b), and on ultrasonography of the right abdominal wall, the abomasum appears as a dilated hollow organ (Braun and Feller, 2008). Intussusception of the small intestine has similar clinical signs and is more difficult to differentiate from HBS. In our experience, intussusception has a slower and slightly longer course and is less common than HBS. Unfortunately, ultrasonography cannot always aid in differentiation of the two disorders because both are associated with dilated non-motile intestine. Furthermore, visualization of the characteristic «*bowel-within-bowel*» pattern of invaginated intestine (Braun, 2003) or blood clots typical of HBS (Braun et al., 2010) is often not possible. In many cases, exploratory laparotomy or postmortem examination is required to differentiate HBS and intussusception.

Many of the cows had haematuria or haemoglobinuria, which was probably due to contamination of the urine with blood from the faeces. Glucosuria was a frequent finding and was likely attributable to hyperglycaemia caused by stress or administration of intravenous glucose by the referring veterinarian. A decrease in urine pH may have been caused by abomasal reflux syndrome, leading to so-called paradoxical aciduria (Radostits et al., 2007b). Acidic urine can also result from catabolism because of anorexia (Gründer, 2002).

The survival rate calculated for our study was 30.2 per cent, which was better than that reported by Abutarbush and Radostits (2005) at 0 per cent and Dennison et al. (2002) at 22.7 per cent, but poorer than that reported by Peek et al. (2009) who discharged 18 (58%) of 31 cows operated because of jejunal haemorrhage syndrome. However, it must be remembered that recurrence is not uncommon even in cows that are apparently health at discharge. In the study by Peek et al. (2009), 15 (48%) and 13 (42%) cows were still alive at follow-up examination six and 12 months later. Although our study did not include follow-up examinations, there were at least two recurrences by the time of this writing. Most authors agree that conservative medical treatment of HBS has a very low success rate. Manual massage of the intestine to reduce the size of blood clots is reported to be more successful than enterotomy and removal of blood clots, or intestinal resection (Peek et al., 2009). In the present study, the three cows that underwent intestinal resection had a good outcome, but this number was too small for a meaningful comparison with the 27 cows that underwent intestinal massage. It was unfortunate that 11 cows had to be euthanased intraoperatively because the lesions were inaccessible in the cranial abdomen, resection was not technically feasible, an extensive amount of intestine was affected or severe lesions excluded surgical correction.

Fifty-eight (92%) cows were Swiss Braunvieh with a large Brown Swiss genetic component. Thus the number of Swiss Braunvieh in the study population was considerably higher than the breed distribution of the hospital population (approximately 1/3 Swiss Braunvieh, 1/3 Holstein Friesian and 1/3 Simmental). Brown Swiss comprised all of the cases described by Ceci et al. (2006) and 12 of 31 (39%) cows in the study by Peek et al. (2009). In other studies, eight of 11 cows (Abutarbush et al., 2005) and all 22 cows (Dennison et al., 2002) were Holstein Friesian. However, taken together, of 138 cows with HBS described in the present and the cited studies, 88 (63.0%) were Brown Swiss or crossbreds thereof, 45 (32.6%) were Holstein Friesian and six (4.3%) were other breeds, including original Swiss Braunvieh, Simmental, Charolais

and Jersey. Thus, two thirds of all cases of HBS were Brown Swiss or crossbreds thereof and one third were Holstein-Friesian cows; HBS seems to be rare in other breeds of cows.

The findings of the clinical examination alone do not always allow a definitive diagnosis of haemorrhagic bowel syndrome, because all of the typical signs, which include absent intestinal motility, absent faecal output and melaena may not be present in every case. Mainly affected are Brown Swiss cows or crossbred thereof and Holstein Friesian cows. The differential diagnosis includes bleeding abomasal ulcer, abomasal volvulus and intussusception of the jejunum. Medical treatment alone has a very low success rate. Treatment of choice is laparotomy with manual massage of the intestine to reduce the size of the blood clots or intestinal resection.

Symptômes cliniques et traitement de 63 vaches souffrant d'heamorrhagic bowel syndrome

Dans ce travail, on décrit les symptômes cliniques, hématologiques et biochimique ainsi que le traitement appliqué à 63 vaches souffrant d'heamorrhagic bowel syndrome. L'état général était moyennement à gravement perturbé chez toutes les vaches, 27 d'entre elles présentaient des signes de coliques. Chez 46 vaches, on a constaté une sous-température rectale et chez 44 de la tachycardie. La motilité intestinale était, à une exception près, réduite voire supprimée chez toutes les vaches. À l'examen rectal, on constatait chez 47 vaches une panse dilatée et chez 18 des anses de grêle dilatées. La défécation était très réduite ou absente et les selles foncées voire noires et hémorragique. 9 vaches ont été euthanasiées directement après l'examen. Chez 2 vaches, on a appliqué un traitement purement médicamenteux ; ces vaches ont du être euthanasiées le lendemain vu l'aggravation de leur état. Chez 52 vaches on a effectué une laparotomie par le flanc droite. 22 d'entre elles ont du être euthanasiées en cours d'opération vu les lésions importantes. Chez 27 vaches un massage intestinal a été effectué et 11 d'entre elles ont du être euthanasiées le lendemain. En outre chez 3 vaches, qui ont toutes survécus, une résection intestinale a été effectuée. Au total, ce sont donc 19 des 63 vaches (30.2%) qui ont pu être guéries.

Prelievi clinici e terapie prestati a 63 mucche con sindrome emorragica di Bowel

Nel presente studio sono stati descritti i prelievi clinici, ematologici, biochimici e la terapia, prestati a 63 mucche affette da sindrome emorragica di Bowel. Lo stato di tutte le mucche si situava tra medio a fortemente alterato. 27 mucche presentavano coliche, in 46 è stata misurata una temperatura rettale bassa e 44 presentavano tachicardia. La motricità intestinale era, a parte un'eccezione, in tutte le mucche ridotta o inesistente. Durante l'esame rettale 47 mucche presentavano un rumine dilatato e 18 un intestino tenue anch'esso dilatato. La defecazione era diminuita fortemente o mancante e le feci erano di colore scuro fino a nero e contenevano sangue. Nove mucche sono state sopresse immediatamente dopo l'esame. Due mucche sono state trattate con una terapia medicamentosa. Entrambe si sono dovute sopprimere il giorno seguente per un peggioramento dello stato. In 52 mucche è stata effettuata nel fianco destro una laparotomia. Di queste, 22 si sono dovute sopprimere a causa di forti aggravamenti intraoperatori. In 27 mucche è stato fatto un massaggio addominale. Tra queste, 11 sono state sopresse i giorni seguenti. In altre 3 mucche, tutte sopravvissute, è stata fatta una resezione intestinale. Alla fine, su un totale di 63 mucche, solo 19 (30.2%) erano sane.

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