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Original Article

Retrospective study of surgical cases of ruminants at Veterinary Teaching Hospital, Bangladesh Agricultural University

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ABSTRACT

Objective: A retrospective survey was designed to determine the prevalence and factors involved in surgical cases at the Veterinary Teaching Hospital (VTH), Bangladesh Agricultural University from June 2014 to June 2017.
Materials and materials: In total, 1042 surgical cases of food animal (large ruminants: n=564, and small ruminants: n=493) and 26 non-food animal (mono-gastric animal) were recorded from patient register book and case recording card. Data were analyzed by Epi Info TM software and frequencies were calculated for different variables using Statistical Package for Social Science (SPSS) software.
Result: In large ruminant, hernia (16.13%) ranked top (90% umbilical and 10% lateral) followed by fracture (14.89%), abscess (14.54%), umbilical myasis (10.46%), atresia ani (5.85%) and naval ill (4.07%). Among the reported cattle, 87.41% were crossbred and 12.59% were indigenous. Calf, heifer and adult cattle were 55.32, 10.29 and 34.39% respectively. In small ruminants, castration (32.94%; n=138) ranked top followed by myasis (10.55%) naval ill (10.31%), abscess (7.44%), dystocia (6.24%) and urolithiasis (5.49%). Based on surgical classification in large and small ruminants, 37.56 and 42.50% were reported for general surgery, whereas 28.71 and 7.15% for congenital, 11.18 and 13.12% for gynecological and 2.65 and 37.23 % for andrological problems, respectively. Male and female ratio was 1:1.31 and 2:1 respectively in large and small ruminants, respectively.
Conclusion: This study emphasizes the factors related to successful surgical cases management at VTH. The results may help in controlling surgical related cases in Mymensingh region of Bangladesh.

KEYWORDS

Caprine; Ovine; Ruminants; Season; Surgical cases

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INTRODUCTION

Economy of Bangladesh is vibrant due to sustainable agricultural development and livestock is an integrated part of it (Madhur and Rashid, 2016) that provides 14.21% in agricultural Gross Domestic Product (GDP) and 3.40% in national GDP (BER, 2017). Currently, livestock population density in Bangladesh is the highest (145/sq. km) as compared to those of India (90/sq. km) and Brazil (20/sq. km) (BARC, 2015). In total, the animal population (cattle, buffalo, goat and sheep) is 54.787 million and bird (chicken and duck) is 32.64 million. It is estimated that about 20% of earning population of Bangladesh are directly and 50% indirectly engaged in livestock production (Sarker et al., 2013).

In Bangladesh, disease occurrence in animal is alarming due to poor management practices and favorable climatic condition for disease occurence (Onneshan, 2014). Veterinary Teaching Hospital (VTH), Bangladesh Agricultural University (BAU) is an ideal point of contact to study the animal diseases pattern as animal owned by people of surroundings area and complex-surgical cases from neighboring upazilla veterinary hospitals are regularly reported to VTH. Therefore, case record analysis could provide a comprehensive scheme for local animal cases.

A number of retrospective studies have been reported in different parts of Bangladesh like BAU (Samad et al., 2002; Ali et al., 2011; Sarker et al., 2013; Islam et al., 2015), Sylhet Agricultural University Veterinary Hospital, Sylhet (Lucky et al., 2016), Haluaghat Upazilla Veterinary Hospital, Mymensingh (Sarker et al., 1999), Dairy Cooperatives in Pabna district (Pharo, 1987), Ulipur Upazilla Veterinary Hospital, Kurigram (Kabir et al., 2010), Chandanaish Upazilla of Chittagong (Pallab et al., 2012), Patuakhali Science and Technology University Veterinary Clinic (Rahman et al., 2012), Hajee Mohammad Danesh Science and Technology University Veterinary Teaching Hospital (Juli et al., 2015). Here, we present the epidemiological survey on surgical cases reported at VTH, BAU. We undertook this study to determine the prevalence of surgical cases in animal attended at VTH, BAU and to analyze the distribution based on species, breed, age, sex, surgery classification, case type, anesthesia, prognosis study and seasonal variation.

MATERIALS AND METHODS

Collection of data: The retrospective survey was conducted to determine the prevalence of surgical cases at VTH, BAU from June 2014 to Jun 2017. Data were collected from patient register book and case recording card with authority's permission. Collected data were analyzed and interpreted to assess disease occurrences pattern and distribution.

Statistical analysis: Collected data were manually checked for errors or missing information and corrected. The data were analyzed by Epi Info TM software version 7.2.1.0 (CDC, Atlanta) and frequencies were calculated for different variables and Statistical Package for Social Science (SPSS) software 20 version was used for *Chi*-square test to know the relation among groups in respective surgical cases. According to Ali et al. (2011), we categorized seasons as: summer (March –June), rainy season (July-October) and winter (November-February).

RESUTS AND DISCUSSION

Breed, age, sex and distribution of surgical cases of large ruminants: The prevalence of surgical cases are shown in **Table 1**. In total, 1042 surgical cases were recorded, in which 54.12% (n=564/1042) were cattle. About 16.13% (n=91/564) cattle were reported with hernia (90% umbilical and 10% lateral) followed by fracture (14.89%), abscess (14.54%), umbilical myasis (10.46%), atresia ani (5.85%) and naval ill (4.07%). About 3 to 4% cases were of minor injury, retention of placenta, pyometra and upper patellar fixation. Cases like dystocia, mastitis, gangrene were also reported.

Among the reported animals, 87.41% (n=493) were crossbred and 12.59% (n=71) were indigenous cattle. Age-wise, calf (55.32%; n=312/1042), heifer (10.29%; n=58/1042) and adult cattle (34.39%; n=194/1042) were reported. Female (56.74%; n=320/1042) was predominant on male (43.26%; n=244/1042). About 37.56% of the cases were responded with general surgery whereas 28.71% with congenital, 19.92% with orthopedics, 11.18% with gynecological and 2.65% with andrological problems.

Temporal distribution of surgical cases are presented in **Table 3**. Temporal distribution shows that about 15% (n=85) surgical cases were referred from neighboring upazilla veterinary hospitals of Mymensingh region and 85% (n=479) admitted to VTH, BAU. During handling of different surgery of cattle, sedative (Diazepam) was commonly used as pre-anesthetic medication and Xylazine or Ketamine was used for induction and maintenance of anesthesia. 2% lidocaine-HCl was commonly used for local anesthesia. Around 5% surgical cases were returned for secondary surgery due to complication of initial surgery.

Table 1: Prevalence of surgical case, breed, age and sex wise distribution of large ruminants.

Surgical case	Total case	Breed		Sex		Age			Surgery type
		Cross-bred	Indigenous	Male	female	Calf (3 m ≤)	Yearling (> 3 and 12 m ≤)	Adult (≥12 m)	
Hernia	16.13% (91)	15.25% (86)	0.89% (5)	8.69% (49)	7.44% (42)	15.07% (85)	1.06% (6)	-	
Fracture	14.89% (84)	10.99% (62)	3.90% (22)	7.45% (42)	7.44% (42)	4.60% (26)	0.89% (5)	9.40% (53)	General (37.56%)
Abscess	14.54% (82)	12.41% (70)	2.13% (12)	9.04% (51)	5.49% (31)	5.14% (29)	3.01% (17)	6.38% (36)	
Umbilical myasis	10.46% (57)	9.22% (52)	1.24% (7)	2.66% (15)	2.66% (15)	8.86% (50)	1.60% (9)	-	
Atresia ani	6.38% (36)	5.67% (32)	0.71 (4)	3.19% (18)	3.19% (18)	6.38% (36)	-	-	
Naval ill	5.85% (33)	5.67% (32)	0.18% (1)	2.84% (16)	3.01% (17)	5.85% (33)	-	-	
Others CG	4.07% (23)	3.72% (21)	0.35% (2)	1.06% (6)	3.01% (17)	4.07% (23)	-	-	Congenital (28.71%)
Injury	4.25% (22)	3.37% (19)	0.53% (3)	1.60% (9)	2.30% (13)	1.42% (8)	1.06% (6)	1.42% (8)	
ROP	3.37% (19)	3.19% (18)	0.18% (1)	-	3.37% (19)	-	-	3.37% (19)	
Pyometra	3.01% (17)	2.84% (16)	0.18% (1)	-	3.01% (17)	-	-	3.01% (17)	Orthopedics (19.92%)
UPF	2.52% (14)	2.30% (13)	0.18% (1)	2.13% (12)	0.35% (2)	-	-	2.48% (14)	
Dystocia	1.77% (10)	1.77% (10)	-	-	1.77% (10)	-	0.53% (3)	1.24% (7)	
Mastitis	1.77% (10)	1.77% (10)	-	-	1.77% (10)	-	0.35% (2)	1.42% (8)	
Gangrene	1.98% (11)	1.42% (8)	0.53% (3)	0.89% (5)	1.06% (6)	-	0.53% (3)	1.42% (8)	
Dermoid cyst	1.24% (7)	1.06% (6)	0.18% (1)	0.89% (5)	0.35% (2)	1.24% (7)	-	-	Gynecological (11.18%)
Prolapse	1.77% (10)	1.06% (6)	0.71% (4)	-	1.77% (10)	-	-	1.77% (10)	
ACM	1.06% (6)	1.06% (6)	-	0.35% (2)	0.71% (4)	0.89% (5)	0.18% (1)	-	
Fistula	0.89% (5)	0.8 (5)	-	0.71% (4)	0.18% (1)	-	0.35% (2)	0.53% (3)	
Hump sore	0.53% (3)	0.53% (3)	-	0.53% (3)	-	-	-	0.53% (3)	Andrological (2.65%)
Dehorning	0.53% (3)	0.53% (3)	-	0.35% (2)	0.18% (1)	0.53% (3)	-	-	
Others	3.37% (19)	2.66% (15)	0.71% (4)	0.53% (3)	2.84% (16)	1.24% (7)	0.71% (4)	1.42% (8)	
Total		**87.41%(493)**	**12.59%(71)**	**43.26%(244)**	**56.74%(320)**	**55.32%(312)**	**10.29%(58)**	**34.39%(194)**	

ACM=Actinomyces; CG=Congenital disorders; ROP= Retention of placenta; UPF= Upper patellar fixation;

Table 2: Species, breed, age and sex wise distribution of surgical cases in small ruminants.

Surgical cause	species	Breed		Sex		Age		Surgical trait
		Black Bengal	**Jamuna pari/Native**	**Male**	**Female**	**Kid**	**Adult**	
Castration	caprine	32.46%(136)	0.48%(2)	32.34%(138)	-	29.36%(123)	3.58%(15)	General (42.50%)
Myasis	Caprine (40)	9.31%(39)	0.24% (1)	2.39% (10)	7.16%(30)	7.16%(30)	2.39% (10)	
	Ovine (4)	-	0.95%(4)	0.24%(1)	0.72%(3)	0.95%(4)	-	
Naval ill	caprine	9.07%(38)	0.24% (1)	6.68%(28)	2.63%(11)	1.91%(8)	7.38% (31)	
Abscess	caprine	7.16%(30)	0.24% (1)	2.86%(12)	4.53%(19)	1.67%(7)	5.73%(24)	
Dystocia	caprine	5.73%(24)	0.48% (2)	-	5.97%(26)		5.97%(26)	
SC	caprine	5.25%(22)	0.24% (1)	1.91(8)	3.58%(15)	1.91%(8)	1.67%(7)	Andrological (37.23%)
ROP	caprine	4.53%(19)	-	-	4.53%(19)	-	4.53%(19)	
Urolithiasis	caprine	3.58%(15)	-	3.10%(13)	0.48%(2)	-	3.58%(15)	
Injury	caprine	3.34%(14)	-	1.43%(6)	1.91%(8)	1.19%(5)	2.15%(9)	
Gid disease	caprine	2.63%(11)	0.24% (1)	1.67%(7)	1.19%(5)		2.86%(12)	
Fracture	caprine	2.86%(12)	-	1.91%(8)	0.95%(4)	2.86%(12)	-	Gynocological (13.12%)
CG	caprine	2.86%(12)	-	1.19%(5)	1.67%(7)	2.86%(12)	-	
Atresia ani	caprine	1.43%(6)	-	1.19%(5)	0.24% (1)	1.43%(6)	-	
Uterine prolapse	caprine	1.19%(5)	-	-	1.19%(5)	-	1.19%(5)	
Hernia	caprine	0.95%(4)	-	0.95%(4)	-	0.95%(4)	-	Congenital (7.15%)
Mastaitis	caprine	0.95%(4)	-	-	0.95%(4)	-	0.95%(4)	
Amputation	caprine	0.95%(4)	0.24% (1)	0.72%(3)	0.48%(2)	-	1.19%(5)	
Orchitis	caprine	0.72%(3)	-	0.72%(3)	-	-	0.72%(3)	
Pyometra	caorine	0.48%(2)	-	-	0.48%(2)	-	0.48%(2)	
Others	caprine	1.19%(5)	-	0.48%(2)	0.72%(3)	0.72%(3)	0.48%(2)	
	Total	**96.66%(405)**	**3.34%(14)**	**60.38%(253)**	**39.62%(166)**	**52.98%(222)**	**47.01%(197)**	

**G= Congenital problem; Jamuna pari = caprine; Native = ovine; SC= Sub-cutaneous cyst; ROP= Retention of placenta;*

Table 3: Temporal distribution of surgical cases of different animals.

Season	Cattle	Goat	Non-ruminant
Rainy (Jul-Oct)	34.38%	26.82%	11.11%
Winter (Nov-Feb)	33.97%	31.31%	34.71%
Summer (Mar-Jun)	31.65%	41.87%	53.96%

Congenital defect is more prominent in crossbred cattle than other species in Bangladesh (Hasan et al., 2015) and umbilical hernia in crossbred male calf are more prevalent in summer (Salim et al., 2015) which are echoed in our findings. The ratio between male and female in our study is 1:1 for atresia ani (6.38%), naval ill (5.85%) and dermoid cyst (1.24%) which is contrasted with findings of Islam et al. (2013), reported as 5:2.

Reproductive tract problems (both gynecological and obstetrical) were more prominent in crossbred cattle rather than indigenous which are in parallel with previous research findings (Talukder et al., 2005; Sarder et al., 2010). The orthopedic surgery ratio between male and female was 1:1 and more prevalent in summer followed by winter and rainy seasons, which is also in agreement with the previous finding (Arju et al., 2014). The relations were significant between surgical cause and breed (χ^2=69.07); surgical cause and sex (χ^2=194.58) and surgical cause and age (χ^2=106.38).

Samad (2011), Sarker et al. (2015) and Islam et al. (2015) reported summer (48%) followed by rainy (30%) as the critical seasons for surgical occurrences, which contrasted to our findings. We reported that highest surgical cases at rainy season (34.38%) followed by summer (33.97%) and winter (31.65%). The relation was significant in between surgical cause and season (χ^2=106.38).

Age, sex, breed and case wise distribution of surgical cases of small ruminants: Among 1042 data, 419 (40.21%) were small ruminant (goat: 415 and sheep: 4). Black Bengal breed (96.66%; n=405) are mostly prevalent than others. Species, breed, age and sex wise distribution of surgical cases in small ruminants is presented in **Table 2**. Castration (32.94%, n=138/1042) was ranked top followed by myasis (10.55%), naval ill (10.31%), abscess (7.44%), dystocia (6.24%) and urolithiasis (5.49%). Male (60.38%) and female (39.62%) ratio was about 2:1 where 52.98% (n=222) were kid and 47.02% (n=197) was adult. Based on surgical correction, 42.50% cases were attended for general surgery including parasitic cause followed by andrological (37.23%), gynecological (13.12%) and congenital disorders (7.15%).

Temporal distributions of surgical cases are presented in **Table 3.** About 3.5% (n=15) surgical cases were referred from neighboring upazilla veterinary hospitals of Mymensingh region and others admitted to VTH, BAU. During handling of different surgery of goat, 2% lidocaine HCl was commonly used for local anesthesia. Around 2% surgical cases were returned for secondary surgery due to complication of initial surgery.

Castration is the mostly attended surgical intervention which is understandable as most of the farmers want to fetch more income by castrating their male goats because castration help in improvement of meat quality which have a great demand at the local market and its management is easier (Khandoker et al., 2011). This study revealed that she goats were significantly more affected with surgical disorders as compared to males. Myasis was more prevalent in female at rainy season which is in agreement with the observations of Juyena et al. (2013). We speculate that due to the genetic issues, geo-climetic situation and husbandry practices, females are more prone to surgical disorders. The relations were significant in between surgical cause and species (χ^2 =34.419) surgical cause and breed (χ^2 = 107.89); surgical cause and sex (χ^2 =213.53) and surgical cause and age (χ^2=193.79).

Temporal distribution of surgical cases in large and small ruminants: Temporal distributions of surgical cases are presented in **Table 3**. Samad (2011), Sarker et al. (2015) and Islam et al. (2015) reported that cattle were mostly susceptible in summer (48%) followed by rainy (30%) and winter (22%) seasons, which coincided to our observations that highest surgical cases at summer (41.87%) followed by winter (31.31%) and rainy season 26.82%. The relation was significant in between surgical cause and season (χ^2=91.051).

CONCLUSION

This study emphasizes the surgical cases and the factors involved in large and small ruminants reported at VTH, BAU. Regular surveillance with retrospective approach may help to identify risk factors of diseases associated with and to imply effective control measure. Our study may help as a baseline survey for common surgical cases reported at VTH in BAU.

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CONFLICT OF INTEREST

The authors declare that there is no conflicting interest with regards to the publication of this manuscript.

AUTHORS' CONTRIBUTION

ZAN and MAH designed the study, interpreted the data, and drafted the manuscript. IH and MA was involved collection of data and also contributed in manuscript preparation. SS and JF took part in preparing and critical checking of this manuscript.

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