FACTORS INFLUENCING DAM SURVIVAL RATE IN BOVINES SUBJECTED TO CAESAREAN SECTION

S.S. DHINDSA[1], G.S. DHALIWAL[2] AND S.P.S. GHUMAN[3]

Department of Veterinary Gynaecology and Obstetrics,
College of Veterinary Science,
Guru Angad Dev Veterinary and Animal Sciences University,
Ludhiana-141 004 (Punjab)

Received : 6.1.2010 Accepted : 5.12.2010

ABSTRACT

Forty-one dystocia affected bovines subjected to caesarean were assessed to investigate the influence of various factors on dam survival rate. With reference to type of suture material (chromic catgut, CC or polyglycolic acid, PGA) used for closing uterine incision either with or without infusion of an intra-peritoneal lubricant (sodium carboxy methyl cellulose, SCMC, 1% @ 14 ml/kg), the animals were divided into group Ia (PGA+SCMC, n=12), Ib (PGA, n=10), Ic (CC+SCMC, n=10) and Id (CC, n=9), which respectively had survival rate of 75%, 50%, 50% and 0%. Depending upon duration between occurrence of dystocia and caesarean, animals were divided into group IIa (<12h, n=12), IIb (12-36h, n=11) and IIc (>36h, n=18) which had survival rate of 72.7%, 41.7% and 33.3%, respectively. Based upon whether animals were handled or not prior to caesarean, animals were divided into group IIIa (previously handled, n=19) and group IIIb (previously not handled, n=22) and their respective survival rate was 36.8% and 54.5%. Based upon the cause of dystocia, animals were divided into group IVa (feto-pelvic disproportion, n=10), IVb (emphysemated fetus, n=9), IVc (uterine torsion, n=10) and IVd (pelvic fracture / abnormal pelvis / fetal monster, n=12) which had survival rate of 60%, 22.2%, 50% and 50%, respectively. In summary, high survival rate was observed in bovines in which PGA was used along with intra-peritoneal infusion of SCMC. Also, the survival rate was high when duration of dystocia was short, dystocia was not handled prior to caesarean and fetus was not emphysemated.

Key words: Bovine, Caesarean section, Dam, Survival rate

Bovine caesarean section remains associated with post-operative complications like higher mortality rate and impaired fertility, despite the fact that most veterinarians are familiar with surgical technique. Natural suture material (chromic catgut, CC) used to close uterine incision produce severe inflammation and adhesion formation in comparison to synthetic sutures like polyglycolic acid (PGA; Dhindsa *et al.*, 2008a). The frequency of intra-abdominal adhesions can be decreased by intra-peritoneal infusion of highly viscous sodium carboxy methyl cellulose (SCMC, Dhindsa *et al.*, 2008a). However, the use of PGA as well as SCMC is rare in bovines. Furthermore, delay in relieving a dystocia may cause fatal biochemical and uterine tissue alterations (Dhindsa *et al.*, 2008b, 2009). Therefore, this study was planned to assess the impact of certain factors on the survival rate of bovines subjected to caesarean. These factors were, a) type of suture material used for closing uterine incision either with or without infusion of an intra-peritoneal lubricant (SCMC, 1% @ 14 ml/kg), b) duration of dystocia, c) handling of dystocia prior to caesarean, and d) cause of dystocia.

The present study was carried out on dystocia affected bovines (31 buffaloes and 10 cattle) that were subjected to caesarean at the university hospital. Caesarean was done in right lateral recumbency under local anaesthesia (lignocaine HCl 2%). Supportive therapy (intravenous fluids, antimicrobials, analgesics, multivitamins and rumenotorics) was given to all animals on the day of caesarean and on subsequent 7-10 days.

Animals were divided into sub-groups on the basis of suture material (CC number-2, PGA-number 2) used for closing uterine incision either with or without infusion of an intra-peritoneal lubricant (1% autoclaved solution

1. Ph.D. Scholar
2. Professor, Department of Veterinary Clinical Services Complex,
3. Associate Professor, Department of Veterinary Gynaecology and Obstetrics

of SCMC @ 14 ml/kg) after applying uterine sutures. The sub-groups were group Ia (PGA+SCMC, n=12), Ib (PGA, n=10), Ic (CC+SCMC, n=10) and Id (CC, n=9).

Animals were divided into sub-groups depending upon the time elapsed between the occurrence and relieving of dystocia viz., group (gp)IIa (<12h, n=12), gp-IIb (12-36h, n=11) and gp-IIc (>36h, n=18).

Animals were divided into sub-groups on the basis of handling of dystocia at field level and / or at university hospital prior to caesarean viz., gp-IIIa (previously handled, n=19) and gp-IIIb (previously not handled, n=22).

On the basis of cause of dystocia, animals were divided into group IVa (feto-pelvic disproportion, n=10), IVb (emphysemated fetus, n=9), IVc (uterine torsion, n=10) and IVd (pelvic fracture/abnormal pelvis/fetal monster, n=12).

The survival of caesarean-operated bovines was assessed by contacting the respective owners about 30 days post-caesarean.

Mean survival rate generated (mean±SE) in different sub-groups was subjected to student's t-test (Dytham, 1999).

In the present study, overall survival rate of caesarean operated bovines was 46.3% (n=19/41). Further analysis revealed that the survival rate in sub-groups Ia (PGA+SCMC, 75%, n=9/12), Ib (PGA, 50%, n=5/10) and Ic (CC+SCMC, 50%, n=5/10) was higher (P<0.05) compared to group Id (CC, 0%, n=0/9). Maximum survival rate following the combined use of PGA and SCMC and least survival rate when only CC was used suggested that the latter technique was not effective in controlling inflammatory or degenerative changes in the uterus of caesarean operated bovines. Similarly, in our previous study, severe inflammation, protein catabolism and stress was observed in caesarean operated bovines in which CC was used alone compared to bovines in which PGA or CC was used along with SCMC (Dhindsa *et al.*, 2008a). In fact, intra-peritoneal infusion of SCMC might have decreased the severity of post-operative peritonitis because SCMC is a highly viscous material which prevents adhesion formation by its lubricating as well as hydrofloatation effect (Moll *et al.*, 1992). This was confirmed by the decreased post-caesarean peritoneal fluid fibrinogen in the bovines which had intra-peritoneal infusion of SCMC (Dhindsa *et al.*, 2008a).

Survivability of caesarean operated bovines was higher (P<0.05) when <12 h (72.7%, n=8/11) had elapsed between the occurrence of dystocia and caesarean in comparison to cases where >12-36 h (41.7%, n=5/12) or >36 h (33.3%, n=6/18) had elapsed. The delay in relieving dystocia may cause detrimental alterations in blood biochemicals which are not favourable for the survivability of dam. In fact, blood urea nitrogen, plasma creatinine, serum ceruloplasmin and total peritoneal fluid proteins were higher and total plasma proteins were lower in cases where dystocia had lasted for longer duration (>12h, Dhindsa *et al.*, 2008b).

The cases of dystocia before being subjected to caesarean at the university hospital are usually handled either at the field level and / or at the university hospital. An injudicious and prolonged handling of dystocia may cause shock and death due to persistent elevation in plasma cortisol that leads to suppression of immune system (Dhaliwal *et al.*, 1991, Ghuman *et al.*, 1998). Similarly, in the present study, survival rate was higher (P<0.05) in cases of dystocia which were not handled previously (54.5%, n=12/22) compared to cases which were handled previously (36.8%, n=7/19).

The survival rate of caesarean-operated bovines was also influenced by the cause of dystocia. The survival rate in animals where feto-pelvic disproportion (60%, n=6/10) was the indication for caesarean was similar to animals that had uterine torsion (50%, n=5/10) or pelvic fracture, abnormal pelvis or monster (50%, n=6/12), but was higher (P<0.05) compared to animals having emphysematous fetus (22.2%, n=2/9). The presence of dead fetus inside the uterus for a prolonged period leads to endotoxemic shock (Dhindsa *et al.*, 2008b).

In conclusion, higher survival rate following caesarean-operation in dystocia affected bovines can be achieved with the use of PGA for suturing uterine incision along with the intra-peritoneal infusion of SCMC. In addition, survival rate following caesarean was high when the bovines subjected to caesarean had short duration of dystocia, dystocia was not handled prior to caesarean and the fetus had not developed emphysema.

REFERENCES

Dhaliwal, G. S., Prabhakar, S., Singh, P. and Sharma, R. D. (1991). Effects of injudicious handling of uterine torsion on survival rate of dam in buffaloes (Bubalis bubalis). *Pakistan. Vet. J.*, **11**: 117-119.

Dhindsa, S. S., Dhaliwal, G. S. and Ghuman, S. P. S. (2008a). Biochemical alterations in bovines due to caesarean operation with reference to suture material and intra-peritoneal lubricant. *Indian. J. of Anim. Sci.*, **78**: 1082-1085.

Dhindsa, S. S., Dhaliwal, G. S. and Ghuman, S. P. S. (2008b). Effect of delay in dystocia on biochemical alterations in bovines., *Indian. J. of Anim. Sci.*, **78**: 1119-1120.

Dhindsa, S. S., Dhaliwal, G. S., Sood, N. K. and Ghuman, S. P. S. (2009). Blood biochemical and uterine tissue alterations in relation to duration of dystocia in caesarean-operated bovines. *Indian. J. of Anim. Sci.*, **79**: 30-33.

Dytham, C. (1999). Choosing and Using Statistics, A Biologoist's Guide. Vol. 2. Blackwell Science Press, London.

Ghuman, S. P. S., Sharma, R. D., Nanda, A. S. and Prabhakar, S. (1998). Effect of certain clinical procedures and stressors on plasma cortisol milieu in dystocia affected buffaloes. *Buffalo J.*, **1**:71-79.

Moll, H. D., Wolfe, D. F., Schumacher, J. and Wright, J. C. (1992). Evaluation of sodium carboxy methyl cellulose for prevention of adhesions after uterine trauma in ewes. *Am. J. of Vet. Res.*, **58**: 1454-1456.