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Effect of midazolam and tramadol for C-section in a primiparous goat

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Abstract
A one year old female non-descript goat was presented with history of kidding signs and water bag ruptured 12 hours before presentation of the case. Vaginal examination revealed narrow pelvis and left lateral deviation of head. Attempts made to relive the foetus were failed and C-section was done under sedation using midazolam at the dose of 0.2 mg/kg and tramadol at the dose of 2 mg/kg in combination with regional anaesthesia inverted "L" block by left lower flank laparotomy. A male dead foetus and placenta was removed manually. Uterus and laparotomy incision closed routinely and the animal made an uneventful recovery. Left flank incision facilitated better exteriorization of uterus without damaging the adjacent visceral organs. The anaesthetic protocol employed by combination of sedative drugs tramadol and midazolam along with regional anaesthesia using lignocaine 2% (inverted 'L') provided pain free surgical environment and early ambulation of the patient.

Keywords: midazolam, tramadol, C-section, primiparous goat

Introduction
Dystocia or difficult birth in small ruminants might be due to failure of shift from stage I to stage II labor and resulted in huge impact on economic loss like perinatal death of dams and foetus, uterine infections, retained placentas and longer lambing or kidding intervals (Scott, 2005) [8]. In sheep and goat cesarean section (C-section) was indicated to manage dystocia when the vaginal delivery was not possible (Scott, 1989, Noakes *et al.* 2009) [7, 6]. Most of the surgical procedures in small ruminants were done under local anaesthesia alone or in combination with sedative agents (Seddighi and Doherty, 2016) [9]. Risk associated with general anaesthesia in small ruminants provoked the use of sedative drugs in combination with regional anaesthesia for various surgical procedures. Tramadol is a synthetic analog of codeine and exhibit its action by interaction with opioid μ receptors in the brain and spinal cord. Simillarly it also exerts its effect by inhibiting the re-uptake of norepinephrine and serotonin results in modulation in pain pathway (De Sousa *et al.*, 2008) [2]. White and Taylor (2000) [12] reported that midazolam was preferable over diazepam in sheep due to its water solubility and can be administered intramuscularly also. The studies on the use of tramadol in combination with benzodiazepines for surgical procedures in small ruminants were limited. This present paper converse the effects of combination of drugs (Tramadol+Midazolam) with regional anaesthesia, etiology and surgical management of dystocia in a primiparous goat.

History and Observation
A one year old female non-descript goat was presented to Veterinary Clinical Complex, Veterinary College and Research Institute, Udumalpet with history of kidding signs for past 24 hours. Anamnesis revealed that water bag was ruptured 12 hours before the presentation of the case. On Clinical examination vital signs were within the normal limits except elevation in heart rate. After aseptic preparation, vaginal examination of the dam revealed narrow pelvis, partially dilated cervix, palpable fetal parts and anterior presentation of the foetus with left lateral deviation of head. Attempts made were failed to relive the foetus. Hence, C-section was advocated for the removal of foetus.

Treatment and Discussion
Left lower flank was prepared aseptically for the surgical intervention. Haematological and serum biochemical parameters were within the normal limits. Preoperatively intravenous fluid therapy was administered to correct the electrolyte imbalance due to dehydration. Midazolam

at the dose of 0.2 mg per kg followed by tramadol at the dose of 2 mg per kg were administered intravenously. An inverted "L" block was made using lignocaine 2% to achieve regional anaesthesia at surgical site. An oblique incision was made on the lower aspect of left flank region. Muscles and fascia were dissected along the length of the incision and the gravid uterine horn was positioned on the incision area after the application of laprotomy pads. An avascular area was selected and longitudinal incision was made on the uterus. A male dead foetus was removed by simple traction without damaging the incision site and uterine structures. Placenta was removed manually and the uterus incision was closed by two rows of inversion suture using chromic catgut No. 1. The abdominal muscles were apposed using catgut No. 1 by horizontal mattress suture. The skin was apposed by simple interrupted suture using cotton thread. Tincture benzoin seal was applied to avoid contamination of the wound. Antibiotic ampicillin and cloxacillin and analgesic flunixine was administered continuously for seven days. Surgical wound was cleaned daily using povidone iodine solution and dressed with povidone iodine ointment. Sutures were removed on the fifteenth post-operative day and the animal made an uneventful recovery.

Dystocia might be due to fetal causes like head deviations, oversize, fetal emphysema and maternal cause like improper cervical dilatation or ring womb (Noakes *et al.*, 2009; Kumar *et al*., 2013) [6, 4], but in this present case narrow pelvis and increased size of the foetus results in failure of vaginal delivery and leads to dystocia which concurs with the findings of Hussain and Zaid (2010) [3] who reported foeto-pelvic disproportion was the risk factor for dystocia in primiparous sheep and goat. Kumar *et al.* (2013) [4] reported that most of the dystocia cases were diagnosed in primiparous animals. C-section was done to avoid excess manipulation of vagina and to improve the fertility and the same was opined by Mahesh *et al.* (2005) [5].

Seddighi and Doherty (2016) [9] opined that combination of local anaesthesia along with sedation in small ruminants shown decreased stress response with improved animal comfort. Tsuchiya (2017) [11] stated that inhibition of superoxide generation by neutrophil via inhibition of protein kinase C activity and reducing surgical oxidative stress in surgical patients under regional anaesthesia. In clinical settings, combined use of regional anaesthesia along with minor sedation provides better intraoperative hemodynamics than general anesthesia alone, particularly in high-risk patients.

De Sousa *et al.*, (2008) [2] also observed no significant changes in heart rate, respiratory rate and rectal temperature in goats administered with tramadol. White and Taylor (2000) [12] and Stegman and Bester (2001) [10] also observed intravenous midazolam administration in sheep and goats at the dose rate of 0.2 to 0.5 mg per kg body weight did not produce significant alterations in vital parameters. The combination of regional anaesthesia (Inverted 'L') along with sedation by midazolam (0.2 mg/kg, IV) and tramadol (2 mg/kg, IV) in the present case showed reduced movement to surgical excision, maintained cardiovascular and respiratory functions within the physiological limits. During the surgical procedure no signs of movement of animal were observed which states that the combination of midazolam and tramadol provided excellent neuroleptanalgesic effect. No signs of potential anaesthetic complications were recorded during the entire surgical period and also during the post anaesthetic period.

Left flank oblique laprotomy approach in the present case provides better exteriorization of the uterus and better handling of uterus without damaging the other visceral organs and the same was advocated by Kumar *et al*. (2013) [4] and Brounts *et al.* (2004) [1].

The manual removal of placenta was attempted in the present case to avoid post-partum complications and the same was reported by Hussain and Zaid (2010) [3] and Kumar *et al.* (2013) [4] stated that retention of placenta was the major problem in small ruminants undergone assisted delivery.

In the present case C-section by left flank facilitated better surgical exteriorization of uterus without damaging the adjacent visceral organs. The anaesthetic protocol employed elicits absence of pre and post anaesthetic complications like ruminal tympany, aspiration and regurgitation. The combination of sedative drugs tramadol and midazolam along with regional anaesthesia (inverted 'L') provided pain free surgical environment and early ambulation of surgical patient.

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