

BLOOD FLOW CHARACTERISTICS OF HEART IN NORMAL AND UTERINE TORSION AFFECTED BUFFALOES

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SUMMARY

The present study was conducted to assess the blood flow pattern in ten buffaloes suffering from uterine torsion. The study was conducted using a SonoScape S6/S6Pro/S6BW ultrasound machine. Color Doppler ultrasound images (2D convex transducer; 2.0-5.0 MHZ) of the heart were obtained from the 3rd and 4th intercostal spaces on both the left and right sides of the thorax of buffaloes after shaving and coupling gel application on the required area. In all cases of uterine torsion the velocity waveform of maternal heart showed high systolic flow and absence of early diastolic flow. In normal advance pregnant buffaloes, the pattern of blood flow was biphasic with both peaks i.e. systolic and diastolic, but the systolic peaks were not as much higher as in cases of uterine torsion.

Key words: Buffalo, Color Doppler ultrasound, uterine torsion, heart

Uterine torsion is rotation of the gravid uterus along its longitudinal axis resulting in severe uterine vascular compression in late pregnant animals (Manju *et al.*, 1985; Roberts, 1986). This condition has been reported as a serious cause of dystocia in buffaloes (Murthy *et al.*, 1999) and is threatening to the lives of both fetus and dam. Unrelieved torsion is likely to be followed by haemorrhagic infarction as the degree of arterial occlusion or compression progresses (Noakes *et al.*, 2009). In some cases, physical examination might not be adequate to evaluate the status of the animal and other advanced tools like Color Doppler sonography might be useful to assess the prognosis of cases. However, presently no information is available about blood flow changes in heart of buffaloes suffering from uterine torsion and predicting prognosis of such cases. In cases of uterine torsion, blood supply to uterus is reduced and there might be some changes in blood flow pattern to heart due to rotation of gravid horn. Therefore, the objectives of this study was to investigate the blood flow pattern in the heart of buffaloes suffering from uterine torsion and compare it with blood flow characteristics of normal advance pregnant buffaloes.

The present study was carried out at Teaching Veterinary Clinical Complex (TVCC) of the university on ten buffaloes that were suffering from uterine torsion. The animals were admitted to the TVCC with the history of no progress in the parturition process or because of a general medical problem like colic,

straining and reduced feed intake in late pregnant buffaloes (mostly between 8th and 10th month of pregnancy). At the clinic, body temperature, pulse rate and heart beat were recorded after restraining the animals in chute. Diagnosis of uterine torsion was done by careful rectal and vaginal examinations after checking the status of broad ligament. A high quality ultrasound machine (SonoScape S6/S6Pro/S6BW; Portable Digital Color Doppler Ultrasound) equipped with 2D convex transducer having switchable frequency between 2.0-5.0MHz designed for trans-abdominal approach was used for assessment of blood flow to heart.

Heart was located between 3rd and 5th intercostal space. At this location blood flow waveforms of heart were obtained by activating the pulsed Doppler function and placing the Doppler gate over ventricles lumen. After that “CDI” and “update” buttons were pressed to get the blood flow pattern of heart of buffaloes. The control group comprised of ten normal pregnant buffaloes of late gestation. Blood flow characteristics of heart were determined in the same way as of the uterine torsion affected buffaloes and were compared.

The pattern of blood flow in normal pregnant buffalo in advanced gestation was different from that of blood flow in uterine torsion affected buffaloes (Figs. 1 & 2). In normal pregnant buffalo, the pattern of blood flow was biphasic with both peaks i.e. systolic and diastolic. On the other hand in cases of uterine torsion

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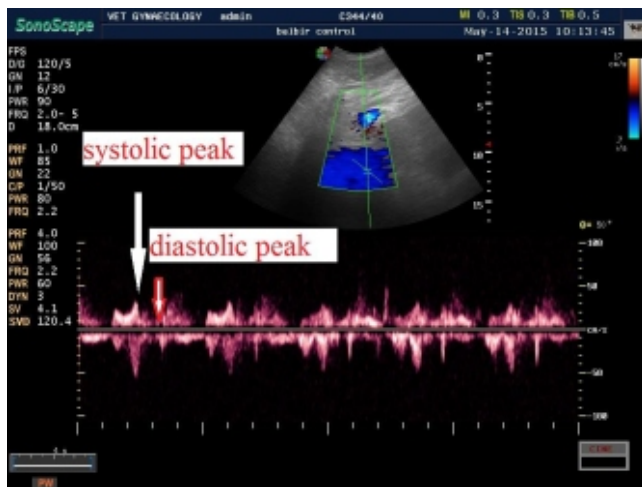


Fig 1. Flow characteristics of heart of a normal advance pregnant buffalo.

affected buffaloes, the velocity waveform of maternal heart showed high systolic flow and absence of early diastolic flow. This showed that the buffalo suffering from uterine torsion had pressure on heart and therefore, changes were observed in blood flow pattern. There seems to be no report available in the literature on this aspect. Hence, the observations could not be compared with other studies. In conclusion, Color Doppler study of heart revealed high systolic velocity and absence of early diastolic blood flow in uterine torsion affected buffaloes and could prove helpful for further research in this regard.

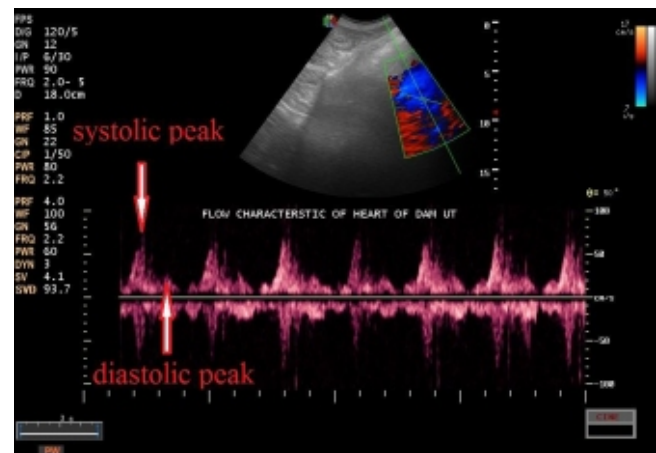


Fig 2. Flow characteristics of heart of buffalo at full term suffering from right side post cervical uterine torsion (greater than 180 degree) since last 24 hours.

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