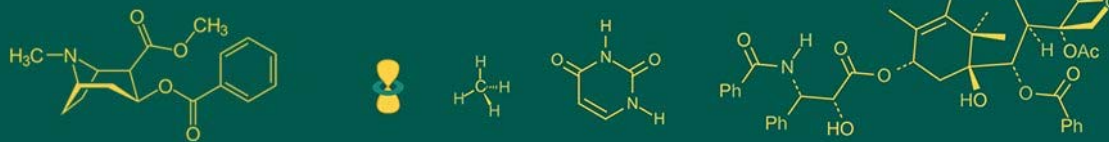


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Ultrasonographic assessment of kidney in dystocia affected buffaloes before and after caesarean section in relation to survival rate

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Abstract

Serum creatinine level has been found at higher level in dystocia affected buffaloes which indicates malfunction of kidney. Caesarean section has been performed in buffaloes for relieving dystocia since 1963 but a prognostic test to predict survivability in buffaloes following caesarean section is unavailable. The findings of present study indicate that the mean pixel value of kidney obtained through ultrasonography may be useful indicator for prognosis of caesarean section in buffaloes.

Keywords: Buffalo, caesarean section, kidney, ultrasonography and survival rate

Introduction

Renal functions are most commonly accessed by measuring serum creatinine levels, as rise in blood creatinine level indicates marked damage to functioning nephrons and increased serum concentrations of creatinine were found in buffaloes affected with uterine torsion^[1] which constitute 67-83% of the dystocias presented at the referral hospitals^[2]. The increased serum creatinine levels in uterine torsion affected buffaloes have been attributed to stress conditions along with reduced blood flow to the kidneys, moderate dehydration, increased energy mobilization during the precalving period and nephropathy resulting from toxic substances liberated from the dead fetus^[1, 3, 4].

Caesarean section has been performed for many centuries and is considered to be one of the oldest operations in the history of human medicine but the first recorded documentation of caesarean section in buffaloes appears to be of Reddy and coworkers in 1963^[5,6]. Caesarean section is indicated in cases of dystocias when calf cannot be delivered by vaginal route and 8 operative sites for the buffalo caesarean section has been established^[5]. The dam survival rate has varied from 36 to 100% in various studies following caesarean section in dystocia affected buffaloes^[5]. However, a definite prognostic test which can predict survival of dam following caesarean section in veterinary medicine is unavailable.

Therefore, the present study was designed to evaluate kidney through ultrasonography in dystocia affected buffaloes before and after caesarean section in relation to survival rate.

Materials and Methods

The ultrasonography was performed on 13 buffaloes after taking case history and diagnosis of dystocia before the start of caesarean section (0 h), after 12 and 24 hours of caesarean (24 h). Ultrasonography was conducted using Toshiba Nemio-XG 3D ultrasound machine. The animals were kept in chute. No sedation was given to animals for Ultrasonographic studies. The transducer was directed perpendicular to right paralumbar fossa when examining the right kidney, while, the left kidney could not be imaged from left paralumbar fossa probably due to change in position by ruminal movements or hindrance by pregnant uterus. Ultrasound gel supplied by Medicine enterprises (Chennai) were utilized for the study. Sonography image captured and management system (Cutes no, Global softwares, Jaipur) installed in the computer attached to the ultrasound machine was used for the recording purposes and subsequent re-evaluation. The brightness and contrast were adjusted to get clear images. The near and far gains were adjusted according to the requirement to check the details of the

images. Good, clear images were frozen and saved in the machine itself for the offline analysis.

Pixel values of kidney were measured with the help of adobe photo shop software after obtaining saved image of kidney from ultrasound machine. Post caesarean section animals were divided into two groups. First group included animals which survived after caesarean section and second group included the animals which couldn't survive after caesarean section.

Statistical analysis

The results are presented as mean ± SE. One way ANOVA and Independent sample t- test was employed to see the difference within group at different time interval and at same time interval between two groups, respectively. All the statistical analysis was carried out by using SPSS 16.0 software program for windows. The 5% ($p < 0.05$) difference was considered as significant.

Results and Discussion

The measurements of pixel values of kidney obtained are

shown in table 1, figure 1 and 2. The mean pixel values of kidney in animals of group 1 (figure 3) were 61.71±4.1 (before caesarean section), 62.28±5.6 (12 hour post caesarean operation) and 63.45±8.6 (24 hour post caesarean section) and in animals of group 2 (figure 4) were 49.48±4.6 (before caesarean section), 49.84±3.49 (12 hour post caesarean operation) and 50.82±3.33 (24 hour post caesarean section) respectively. Pixel values of kidney were significantly ($p < 0.05$) lower in animals those died as compared to animals those survived at all-time points of observations. There are no parallel reports in literature to confirm or refute our findings but decreased pixel value of kidneys along with a slight decrease in longitudinal and transverse length of kidney has been reported by Yadav [7] in buffaloes affected with uterine torsion. Decreased pixel value in animals which died may be due to more pronounced fluctuation in the blood supply to kidney in comparison to animals which survived as increased serum creatinine levels in uterine torsion affected buffaloes have been attributed to reduced blood flow to the kidneys [1].

Table 1: Measurements of pixel values of kidney (mean ± SE) of animals survived and died

Groups	0hr	12hr	24hr
Pixel value of kidney in group 1 (survived)	61.76±4.1 ^A	62.28±5.6 ^A	63.45±8.6 ^A
Pixel value of kidney in group 2 (died)	49.48±4.36 ^B	49.84±3.49 ^B	50.82±3.33 ^B

^{A,B} different superscript differ significantly ($p < 0.05$) within column

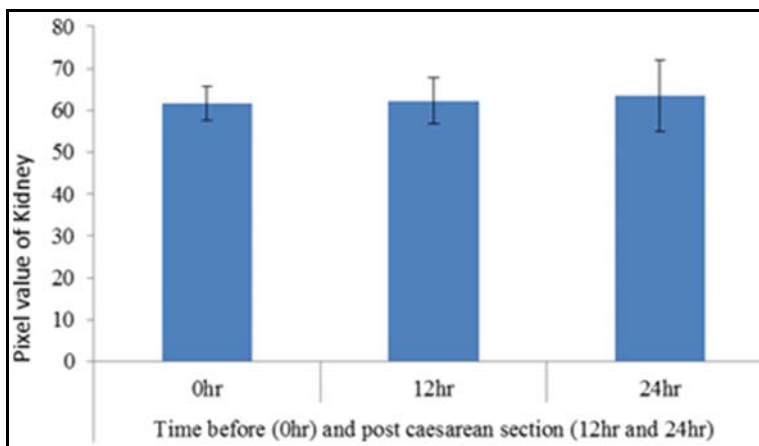


Fig 1: Measurements of pixel values (mean ± SE) of kidney in group 1 animals (survived)

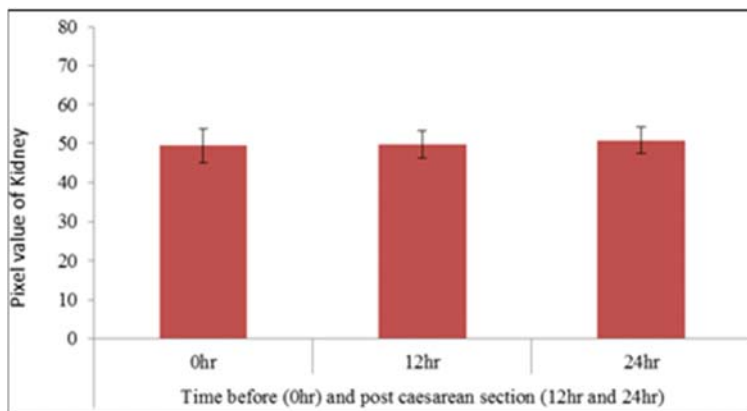


Fig 2: Measurements of pixel values (mean ± SE) of kidney in group 2 animals (died)



Fig 3: Ultra sonogram of kidney in animal from group1 (survived)

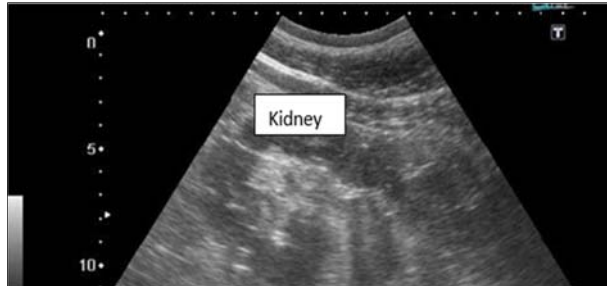


Fig 4: Ultra sonogram of kidney in animal from group 2 (died)

Conclusion

Pixel values of kidney can be taken as parameter to assess the possibility of caesarean section outcomes in terms of survivability of buffaloes.

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