PHYSIOLOGICAL PROFILE IN NEONATE CALVES OF PURNATHADI BUFFALO

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ABSTRACT

A study was undertaken to record the variations in physiological parameters [body weight (BW), rectal temperature (RT), respiration rate (RR) and heart rate (HR)] in six Purnathadi buffalo calves. The parameters were recorded on day 0 (day of birth) and days 3, 10, 20 and 30 days of age. Rectal temperature and respiration rate was found to be non significant through out the 30 days study with overall mean of 100.93 ± 0.14 $^{\circ}$F and 22.33 ± 0.64 breaths/min respectively. Heart rate was significantly high on the day of birth (106.47 ± 2.48 beats/min) and dropped significantly with advancing age of 30 days (85.67 ± 5.57 beats/min) with overall mean of 96.37 ± 1.85 beats/min. Body weight was lower on day of birth (19.83 ± 1.33 kg) and increased significantly as the age advances to 30 days (30.32 ± 2.19 kg)

INTRODUCTION

The neonatal period represents a critical stage in development of physiological functions. During this adaptive period, the changes necessary to adapt to the extra-uterine life take place in newborn animals. Adaptation in some body systems is slower than in others and there are also some variations between species (Piccione et al., 2007 and 2008). Since the information on the physiological parameters immediately after birth (day 0) to one month (day 30) of age in buffalo calves seems to be scanty, the present study was therefore ,conducted in Purnathadi buffalo calves, to observe and understand the variations in the parameters during this period which may help in controlling neonatal mortality in this species.

MATERIALS AND METHODS

For this study advance pregnant Purnathadi buffaloes maintained under standard feeding and management conditions at farm of Post Graduate Institute of Veterinary and Animal Sciences, Akola were selected. The calves born to these buffaloes were considered for the study. Physiological responses of the calves were recorded on day 0 (immediately after birth) followed by , 3, 10, 20 and 30 of age. Body weight was recorded using digital platform balance. Rectal temperature was recorded using digital thermometer. Respiratory rate was recorded by noting the flank movements along with the respiration at the nostrils of the calves. Heart rate was recorded with the help of a stethoscope. The data obtained in the present study was subjected to statistical analysis using the CRD design as per the Snedecor and Cochran (1989)

RESULTS AND DISCUSSION

Parameterwise results of the present study described as below :

Body weight

The mean body weight of Purnathadi buffalo calves on day 0, 3, 10, 20 and 30 was 19.83 ± 1.33, 22.22 ± 1.31, 25.30 ± 1.59, 27.77 ± 1.79 and 30.32 ± 2.19 kg respectively. Difference in live weight was observed with the increase in age and was significantly higher on day 30. The overall mean

body weight from birth to 30 days of age was 25.09± 0.98 kg in Purnathadi buffalo calves. Suresh Babu (2013), Afzal *et al.* (2009) and Vasanthakumar *et al.* (2008) recorded higher birth weight in Murrah, Nilli-Ravi and in Murrah and Surti graded buffalo calves respectively than the present study which might be due to breed difference. An increase in live weight during neonatal period is a well established phenomenon which can be influenced by nutrition, high temperature and diseased conditions (Saddiqi *et al.*, 2011). The calves gained 10.48±1.18 kg live weight in 30 days period with overall average daily gain in body weight from birth to 30 days of age was 0.35±0.04 kg. Suresh Babu (2013) observed comparable gain in Murrah from birth to 3 months with the weight gain of present study whereas, Afzal *et al.* (2009) observed higher growth rate upto 9 months in Nilli-Ravi calves (0.433±0.056) this might be due to genetic make-up and managemental practices adopted by the farmers in the country.

Rectal temperature:

Rectal temperature is generally used as a measurement of animal core temperature (Swanson and Reece 1996). The rectal temperature, was 101.14± 0.49 on day 0 which declined nonsignificantly to 100.71± 0.04 on day 10 and remained nearly constant till day 30 (100.63±0.10). The mean rectal temperature from birth to day 30 of age was 100.93±0.14 ^{0}F in Purnathadi buffalo calves. Similar results are reported by Jain *et al.* (2007) in buffalo calves.

Respiration rate

Respiration rate is indicative of the physiological status of the animal and varies with age, size and species of the animal. The mean respiratory rate of Purnathadi buffalo calves on day 0, 3, 10, 20 and 30 was 22.69 ± 2.42, 22.39±1.79, 22.93±1.07, 22.39±0.59, and 21.28±1.07 breaths /min respectively. The mean respiration rate from birth to day 30 of age was 22.33±0.64 breaths/min in Purnathadi buffalo calves. The RR values found in the present study for day 0 were lower than that reported by Feitosa *et al.* (2012), similarly the values reported by Jain *et al.* (2007) from day 0 to day 30 in buffalo calves are higher than found in the present study. There was nonsignificant decrease in respiration rate from day 0 to day 30. Dang *et al.* (1998) found higher respiration rate at birth and then observe gradual decrease reaching adult values by six months of age. The trend obtained in present study was similar to those obtained by Dang *et al.* (1998) and Kaushish (2000).

Heart rate

Heart rate of the animal is directly related to its post natal age and is indicative of the homeostatic adaptations that it undergoes till it attains its adult values. The mean heart rate of Purnathadi buffalo calves on day 0, 3, 10, 20 and 30 was 106.47±2.48, 103.45±1.29, 92.47±1.67, 93.78±0.60 and 85.67±5.57 beats /min respectively. The mean heart rate from birth to day 30 of age was 96.37±1.85 beats/min. The values showed a continuous decline as the age of the animal advanced. The value obtained at birth were higher than the value obtained on day 3 of age, which was significantly higher than that obtained on 10, 20 and 30 days of age. During the 30-day study period, heart rate decreased from mean 106.47±2.48 to 85.67±5.57 beats/min. This decrease in heart rate was not consistent as it decreased sharply from day 3 to day 10 of age followed by an irregular increase and decrease (p<0.001) again at the end of the trial. The mean HR values found in the present study for day 0 was lower than that reported by Swanson and Reece (1996) and also Feitosa (2012) whereas, Jain *et al.* (2007) reported higher values from day 0 to 30 than found in the present study. McKenzie (2011) reported heart rate of large animal neonate is usually >80 bpm. Increased heart rate at birth may be due to the stress and excitement due to the new environment to which the calves are exposed. The progressive decline in the heart rate as the age increases is physiological response till it reaches the adult values.

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