

PRECOCIOUS UDDER DEVELOPMENT ASSOCIATED WITH CYSTIC FOLLICLES IN A 22 DAYS OLD FEMALE CALF

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ABSTRACT

A 22 days old Jersey crossbred female calf was reported with the history of udder enlargement and milk secretion for a period of over 10 days after birth. Based on the follicular, udder and endocrine status, the present case was diagnosed as precocious lactogenic udder development associated with cystic follicles and endocrine imbalance. Hyper-oestrogenism and hyper-prolactinemia were ascribed to be the causative factors for the anomaly in the neonatal calf.

Key words: Neonatal calf, udder development, lactogenesis, cystic multiple follicles, endocrine imbalance

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INTRODUCTION

In cattle, the development of the mammary gland starts early in the foetal life but secretory or glandular structures develops only in the post-pubertal heifers during the peri-parturient period. However, udder development and spontaneous lactation were reported rarely in young

prepubertal heifer calves of 8-15 months old (Ambrose and Emmanuel, 2008; Gunn and Reader, 2015 and Ghosh *et al.*, 2023). While previous reports focus on mature heifers, present study documents a rare case of udder development and lactation in a neonatal calf, triggered by endocrine imbalance and large cystic follicles.

CASE HISTORY AND OBSERVATIONS

A 22 days old Jersey crossbred female calf was brought to the large animal Gynaecology unit of Veterinary Clinical complex, Veterinary College and Research Institute, Orathanadu with the history of udder enlargement and milk secretion for

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a period of over 10 days after birth. The animal was active and alert. On clinical examination, the udder was found to be enlarged and soft in consistency with no evidence of pain on palpation (Fig.1). Milk secretion was evident from all the four teats. B-mode ultrasonographic examination of the udder revealed anechoic glandular alveoli (Fig.2) development similar to normal adult lactating cow, confirming the established lactogenic activity.

Per-vaginal digital examination was performed which resulted in accidental rupture of intact hymenal tissue followed by evacuation of clear stringy discharge (Fig.3), suggestive of increased secretory activity.

Transrectal ultrasonography was performed (7.5 MHz linear transducer; Sonoscape S2V, Italy), to assess the utero-ovarian status. The diameter of the right and left ovaries were 17.3 mm and 10.8 mm respectively. Interestingly, both the right and left ovaries had a large sized follicle measuring 10.10 mm and 10.30 mm respectively (Fig.4). Additionally, a medium (7.30 mm) and a small size (4.40 mm) follicles were present on the right ovary.

Blood was collected aseptically and subjected for serological estimation of steroids (oestradiol and progesterone) and prolactin by fluorescence-based lateral flow immunoassay method using the immunoassay analyser (iChroma II; Boditech, Korea). Hormonal analysis revealed a high oestradiol (32.00 pg/ml) and a lower progesterone (0.14 ng/ml) concentration along with higher prolactin concentration (94.00 ng/ml).

Based on the ovarian, udder and endocrine evaluation, the present case was diagnosed as precocious lactogenic udder development associated with cystic follicles and endocrine aberration.

TREATMENT AND DISCUSSION

Taking into consideration of the modes to control the lactogenic activity and ovarian hyperactivity, the neonatal calf was treated once with Inj. Prednisolone (0.50 mg/kg; i.m.) and Inj. Buserelin acetate (5.00 mcg; i.m.). Tab. Cabergoline was also administered @ 5.00 mcg/kg; orally for five days. Subsequent examination after 10 days revealed absence of milk secretion with slight reduction in the udder size. However, due to the unwillingness of the owner, further diagnostic investigations could not be performed.

Normally the diameter of the follicles will be ranging between 1-5 mm in two to three months old calves (Zacarias *et al.*, 2015; Laine *et al.*, 2019), but in the present case, two follicles with diameter > 10.00 mm were observed which were similar to the size of dominant follicles in adult cows. Hence, these follicles could be considered as cystic. Perusal of literatures revealed that this is the first report to document the occurrence of cystic multiple follicles in a crossbred neonatal calf.

The development of lactogenic ducts and tissues usually take place between puberty and parturition with initiation of lactogenic activity in the periparturient period. Endocrine imbalance

due to congenital or developmental issues, including ovarian cysts or oestrogen-secreting granulosa cell tumours (GCT) are reported to be the causative factors for premature udder development and lactation in prepubertal heifer calves (Gunn and Reader, 2015). In the present case, ultrasonographic documentation ruled out the occurrence of GCT, but confirmed the presence of cystic follicles in ovaries.

Endocrine analysis and genital secretion confirmed the hyper-oestrogenic activity in the neonatal calf, which could be attributed to the presence of multiple cyst-like large follicles. Reports confirm that mammary gland duct growth and milk secretion could be triggered in non-pregnant cattle by elevated oestrogen and progesterone (Ambrose and Emmanuel, 2008). In addition, elevated prolactin concentration (94.00 ng/ml) was recorded, as against the normal range of 7.00 to 30.90 ng/ml, which might be due to premature hypothalamic-pituitary mammary axis activation (Stanisiewski *et al.*, 1988). Thus, endocrine imbalance characterized by increased oestrogen and prolactin was considered to be the most important factor for the precocious udder development and lactogenesis in the neonatal calf under report.

Similar condition of premature udder enlargement with milk secretion were reported in two other young calves (unpublished data) and in a 10-day old goat kid (Karthika *et al.*, 2026) of the same region. Hence, phyto-oestrogen toxicity through ingestion of oestrogenic plants (Ahuja *et al.*, 2023) or exposure to endocrine disrupting chemicals have to be strongly suspected, warranting a detailed regional investigation.

CONCLUSION

A very rare incidence of premature udder development with lactogenesis and ovarian hyperactivity in a calf less than a month old was reported. Hyper-oestrogenism (due to cyst-like large sized multiple follicles) and hyper-prolactinemia were ascribed to be the causative factors for the anomaly in the neonatal calf.

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Fig.1. Examination enlarged udder

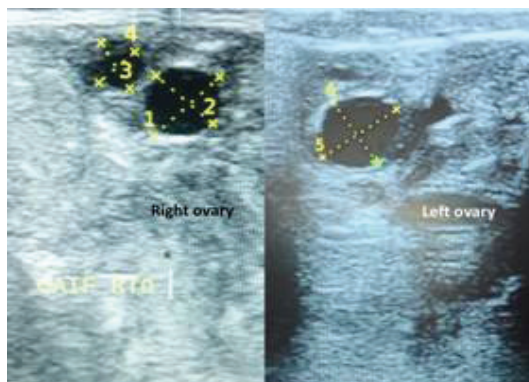


Fig.2. Ultrasonographic documentation of mammary gland duct development



Fig.3. Vaginal discharge

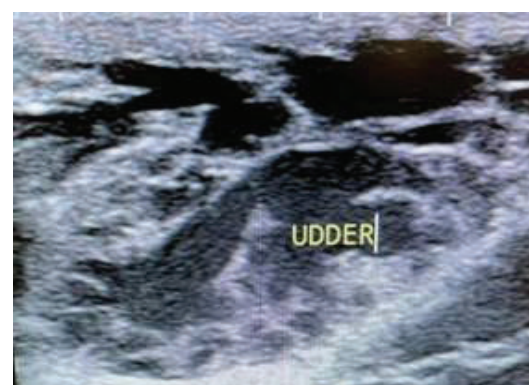


Fig.4. Ultrasonographic documentation of cystic large follicles in both the ovaries

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