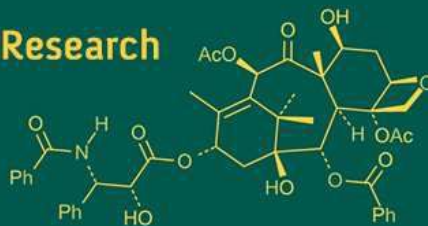
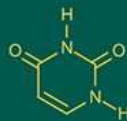


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Incidence of follicular cysts in buffaloes

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Abstract

Cystic ovarian disease (COD) is a common reproductive disorder in buffalo herds, which leads to significant economic losses in the livestock industry worldwide. The incidence of cystic ovaries varies across different geographical regions and is influenced by various factors such as age, parity, breed, nutritional status, and management practices. In the present study ovaries were randomly from an abattoir in summer and winter season and were categorized in normal and cystic ovaries (having follicular cysts). In the present study the incidence of cystic ovaries was 7.5% in summer season and 5% in winter season.

Keywords: Incidence, buffalo, cystic follicles

Introduction

Buffaloes, the second-largest milk producer in the world, generate more than one-third of Asia's total milk production. According to Sharma *et al.* (1993) [23], 18 to 40 percent of cattle and buffaloes in India are slaughtered each year mostly owing to infertility, low fertility, or sterility, which directly hampers the farmer's genetic resource. The buffalo's ability to reproduce is significantly impacted by a variety of cysts that can be seen on its ovaries, including follicular cysts, luteal cysts, and cystic corpora lutea. All of these conditions are referred to as cystic ovarian disease (COD). COD continues to be a significant factor in the lengthening of the time between calving and conception (Dohoo, *et al.*, 1984) [6], as well as the increased number of inseminations required for each conception, both of which reduce reproductive performance (Oltenu *et al.*, 1990) [14]. Also one of the factors lowering milk supply and production potential is reproductive problems. One of the major contributing factors to buffalo infertility is ovarian issues (Das and Khan, 2010) [5].

There are several types of cysts that can be found on the ovaries of the buffaloes, which can have a significant impact on the reproductive efficiency of the animal. The cystic structures that were studied included follicular cysts, luteal cysts, and cystic corpora lutea.

Due to the increased calving-to-conception and inter-calving intervals caused by this disease, the dairy sector suffers significant financial losses. If the condition persists, the animals should be removed from the herd (Peter, 2004; Cattaneo *et al.*, 2014) [16, 4]. The prevalence of this condition varies from 5 to 30% in dairy cattle (Garverick, 1997; Silvia *et al.*, 2002, 2005; Peter, 2004; Vanholder *et al.*, 2006; Probo *et al.*, 2011; Rizzo *et al.*, 2011; Cattaneo *et al.*, 2014; Ortega *et al.*, 2016) [7, 21, 16, 22, 18, 20, 4, 9]; whereas, it varies from 2.7 to 30% in buffalo (Hatipoglu *et al.*, 2000; Azawi, 2009) [11, 1]. The normal reproductive cycle is disrupted by one or more follicles in the ovaries measuring more than 20 mm in diameter and remaining there for up to 10 days without luteal tissue. This condition is known as cystic ovarian disease (Silvia *et al.* 2002) [21].

Materials and Methods

This study was carried out in the Laboratory of Reproductive Biotechnology belonging to Department of Animal Biotechnology, College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar. Buffalo ovaries (n= 1800) were collected from Municipal Corporation of Delhi Slaughter House, Frigorifico Allana Limited, Ghazipur Delhi in both summer (May-June) and winter (December-January) season. Ovaries were transported within 4-5 hours in a thermos flask containing sterilized normal saline

solution (NSS) maintained at 35-37 °C supplemented with antibiotics (Penicillin @ 100 IU/ml and Streptomycin sulphate @ 100 µg/ml).

In the present experiment, only the pre-ovulatory sized follicles of about 12-14 mm in diameter and cystic follicles i.e. equal to 20 mm in diameter or more were taken in study (Gimenes *et al.*, 2011 and Pandey *et al.*, 2013; Baravalle *et al.*, 2015) [8, 15, 2]. Diameter of Follicles was measured using a divider compass and a metric scale as described by Khan *et al.* (2011) [12] and follicles were divided into two categories on the basis of the diameter.

1. Normal preovulatory follicles (n=30): all visible pre-ovulatory sized follicles of 12-14mm diameter.
2. Cystic follicles (n=30): all follicles of size ≥ 20 mm diameter.

Results and Discussion

Infertility in buffaloes presents a multifaceted challenge, with both hereditary and environmental factors playing significant roles in its manifestation. The incidence of cystic ovaries in buffaloes can be affected by various factors such as breed, management practices, nutritional status, and environmental conditions. Ovarian cysts are a common reproductive disorder in dairy animals, including buffaloes. These cysts are characterized by the persistence of large follicular structures that fail to ovulate and may continue to grow for at least 10 days in the absence of a luteal structure, which can disrupt normal reproductive functions (Silvia *et al.*, 2002) [21]. Different researchers have carried out studies for incidence of cystic ovaries in buffalo in-vivo, in-vitro and from abattoir samples. In the present study the incidence of cystic ovaries was 7.5% in summer season and 5% in winter season. In total 1800 ovaries were collected from an abattoir during summer and winter season. An incidence rate of 5.41% for follicular cysts in buffalo, as reported by Raja and Srilatha (2007) [19], aligns with the general understanding of cystic ovarian follicle prevalence in buffalo populations. In a similar study conducted by Kumar *et al.* (2023) at an abattoir, reproductive tracts from 215 buffalo, along with intact ovaries, were collected randomly. These findings revealed an incidence of cystic conditions of 3.72% (8/215). Interestingly, during the non-breeding season, cystic conditions were observed more frequently in the right ovary (62.5% of instances) compared to the left ovary (37.5% of instances). Sharma *et al.* also observed a prevalence of 3.75% follicular cysts in buffaloes. Additionally, they reported other conditions such as ovaro-bursal adhesions (2.08%), smooth ovaries (7.29%), oophoritis (3.33%), par-ovarian cysts (1.25%), right side follicular cysts (2.51%), left side follicular cysts (0.41%), and bilateral cysts (0.83%) suggesting that follicular cysts are a notable concern in the reproductive health of buffaloes, alongside other ovarian conditions.

According to a recent study, ovarian affections were found to be the primary pathological findings, followed by uterine affections, accounting for 17.35% and 9.12% of cases, respectively (Hamouda *et al.*, 2020) [10]. The study also recorded follicular cysts in 8 cases (8/340) accounting to 2.35% incidence. Interestingly, the study also revealed that during the summer season, there was a higher incidence of ovarian and uterine lesions compared to other seasons which are similar to the present study. These findings also aligns with the previous observations made in female buffaloes as noted by Ponraj *et al.* (2017) [17]. The increased incidence

during summer is thought to be due to the suppression of ovarian activity and elevated embryonic deaths during periods of lengthening daylight, as outlined by Campanile *et al.* (2007) [3].

This study sheds light on the prevalence and distribution of cystic conditions in buffalo reproductive tracts, providing valuable insights into the reproductive health of these animals during different seasons. Such information is crucial for understanding and addressing reproductive disorders in buffalo herds, ultimately contributing to improved management practices and herd fertility.

Conclusion

The prevalence of cystic ovaries in buffaloes underscores a complex interplay of genetic predispositions, environmental factors, and management practices. The incidence rates observed across different studies highlight a seasonal variation, with higher occurrences typically noted during the summer months. This underscores the importance of environmental conditions in influencing reproductive health outcomes. Insights gained from these findings are pivotal for enhancing management strategies aimed at mitigating reproductive disorders in buffalo herds. Addressing these challenges effectively holds promise for bolstering overall herd fertility and welfare, ensuring sustainable livestock production in agricultural settings.

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