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STREPTOCOCCUS SPP. ISOLATED SUBCLINICAL MASTITIS AND ITS EFFECT ON PUBLIC HEALTH

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ABSTRACT

The high protein content of milk makes it a crucial component of human nutrition. The mammary tissue of dairy cattle is seriously harmed by the severe disease known as mastitis. Mastitis is a widespread and economically significant infectious disease that affects dairy cows globally. One of the most frequent causes of subclinical mastitis in dairy cows and one of the most frequent indications for antibiotic therapy is *Streptococcus* spp. The purpose of the study was to investigate the presence of *Streptococcus* spp. isolates in subclinical mastitis in bovine milk. The presence of subclinical mastitis was investigated in 77 dairy animals. After the evaluation, 32 (41.5%) dairy animals showed positive results. *Streptococcus* spp. was detected in nine isolates (19.50%). As a result, it has been demonstrated that *Streptococcus* spp. still play a significant role in the etiology of subclinical mastitis. This has the potential to present an important concern for public health.

Key Words: Dairy animals, Milk, Subclinical mastitis, *Streptococcus* spp.

1. INTRODUCTION

Mastitis is a prevalent and economically significant infectious disease affecting dairy cows worldwide (1). It is characterized by mammary gland inflammation, resulting in reduced milk production, altered milk quality, and compromised animal welfare (2). Mastitis is estimated to cost each animal between 61 and 97 Euros. Cost-related factors include decreased milk production, veterinarian services, diagnostic fees, medication applications, damaged milk, subpar product quality, and the risk of developing the same or new diseases (3, 4).

Streptococcus species are among the major pathogens responsible for mastitis, causing substantial losses in the dairy industry. The most significant *Streptococcus* spp. strains responsible for mastitis are *S. agalactiae*, *S. dysgalactiae*, and *S. uberis* (5, 6). While clinical cases of *Streptococcus* mastitis are visibly evident, subclinical mastitis, characterized by the absence of apparent clinical symptoms, is a hidden challenge that often goes unnoticed but significantly impacts herd productivity and milk quality (7).

Subclinical mastitis is a common form of mastitis, affecting a substantial proportion of dairy herds globally (8). The infection remains predominantly subclinical, making it difficult to identify affected cows without diagnostic tests. *Streptococcus* species, including *Streptococcus agalactiae, Streptococcus dysgalactiae*, and *Streptococcus uberis*, are frequently associated with subclinical mastitis (9). These bacteria colonize the udder, often persisting for extended periods, and silently impairing milk production and quality (10).

The consequences of subclinical *Streptococcus* mastitis extend beyond individual cows, impacting

the entire herd's productivity and profitability (3). Infected cows experience reduced milk yield, increased somatic cell counts (SCC), and altered milk composition, including decreased protein content and increased levels of inflammatory markers. The cumulative effects of subclinical mastitis can result in significant economic losses due to reduced milk production, increased treatment costs, discarded milk, and lowered milk quality (11, 12). Detecting subclinical infections is crucial for implementing effective control measures, preventing the spread of pathogens, and reducing the prevalence of clinical mastitis cases within the herd (13).

Given the economic and animal welfare implications of *Streptococcus* spp. subclinical mastitis, it is essential to deepen our understanding of its epidemiology, pathogenesis, and management strategies (14). This article aims to isolate *Streptococcus* spp. in subclinical mastitis.

2. MATERIALS AND METHODS

2.1. Collection of milk samples with subclinical mastitis

One of Turkey's major milk-producing provinces is Burdur. Three different farms monitored a total of 77 dairy cows. The first milk drops were discarded after cleaning the teats with an antibacterial solution. Milk obtained from teats was evaluated for mastitis in the California Mastitis Test (CMT) (15).

2.2. *Streptococcus* spp. isolation from milk samples

Subclinical mastitis-related milk samples were plated on Columbia blood (5% (v/v)) agar (CBA, Oxoid, Italy) and incubated at 37 °C for 24-48 hours. Additional tests were conducted on colonies on the CBA that were cream in color (16). Identifying *Streptococcus* involves using various examinations such as microscopic and macroscopic morphology, biochemical tests, and CAMP tests (17).

3. RESULT AND DISCUSSION

In this study, the presence of subclinical mastitis in 77 different dairy cows was studied. After the study, it was determined that 32 (41.5%) of the dairy animals had demonstrated positive results by CMT. Nine of the isolates (19.50%) were found to contain evidence of *Streptococcus* spp. based on the results of identification tests. The present study focused on *Streptococcus* species as the predominant pathogens causing mastitis in the dairy herd. The isolation rates of *Streptococcus* spp. from milk samples were consistent with previous reports, highlighting the persistent nature of this infection and its impact on dairy production (18). The high prevalence of *Streptococcus* mastitis emphasizes the need for effective control and prevention strategies to minimize economic losses and ensure animal welfare.

The infected quarters showed a significant decrease in milk production and altered milk composition, including increased somatic cell counts and decreased milk protein content. These findings align with previous studies, underscoring the negative consequences of *Streptococcus* mastitis on milk yield and quality, which directly affect farm profitability and consumer safety (19).

The study findings also shed light on the management practices and risk factors associated with streptococcal mastitis. Poor hygiene, inadequate milking practices, and environmental contamination were identified as potential risk factors contributing to the transmission and persistence of *Streptococcus* spp. within the herd. Implementing proper pre- and post-milking hygiene protocols, regular monitoring, and early detection of infected cows are crucial steps in preventing and controlling streptococcal mastitis (14).

4. CONCLUSION

In conclusion, this study provides valuable insights into the prevalence of streptococcal mastitis in dairy cows. The findings underscore the importance of implementing comprehensive mastitis management programs, focusing on both prevention and control strategies. Efforts should be directed towards improved biosecurity measures, optimization of antibiotic use, and the development of novel therapeutic approaches to mitigate the burden of streptococcal mastitis on dairy farms.

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Ethical Statement: This study does not present any ethical concerns.

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