



## Therapeutic strategies for subclinical endometritis in bovines

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### *Abstract:*

Subclinical endometritis is a prevalent reproductive disorder in bovines, leading to decreased conception rates and economic losses. Apart from intrauterine infusions and antibiotics, this paper reviews alternative therapies for subclinical endometritis including immune-modulators, herbal remedies, homeopathic treatments, and acupuncture therapy. By exploring these alternatives, producers can make informed decisions to improve reproductive performance and herd profitability.

### **Introduction**

Subclinical endometritis, a common reproductive disorder in bovines, poses significant challenges to herd fertility and productivity, characterized by the presence of polymorphonuclear cells in uterine cytology samples during the early postpartum period. Subclinical endometritis often goes unnoticed but can lead to reduced conception rates and increased days open, contributing to economic losses for dairy producers. Traditional treatments for subclinical endometritis typically involve intrauterine infusions, antibiotics and hormonal therapies, but concerns over antimicrobial resistance and side effects have prompted exploration into alternative approaches. In recent years, researchers have investigated various alternative therapies for subclinical endometritis, aiming to improve treatment efficacy while minimizing potential drawbacks. These alternative treatments encompass a diverse range of modalities, including immune modulators, herbal remedies, homeopathic treatments, and acupuncture therapy. Each approach offers unique mechanisms of action and therapeutic benefits, giving dairy producers additional options for managing subclinical endometritis in their herds. This paper provides an overview of alternative therapies for subclinical endometritis in dairy cattle, summarizing the findings of recent studies.

### **Therapeutic strategies for subclinical endometritis in bovines:**

**Lugol's Iodine:** Research indicates that intrauterine infusion of 0.5-1% Lugol's Iodine solution effectively treats subclinical endometritis (Ahmed and Elsheikh, 2014). Studies in bovines with



repeat breeding show a 60% recovery rate and a 40% conception rate following intrauterine Lugol's Iodine (Bhardwaz *et al.*, 2018). This treatment significantly reduces uterine bacterial load and shows a non-significant decrease in polymorphonuclear leukocyte percentage compared to controls. Lugol's Iodine presents a cost-effective and beneficial alternative therapy for subclinical endometritis treatment (Asfar *et al.*, 2020).

**Antibiotics:** Antibiotics such as Gentamicin, Ceftiofur and Levofloxacin are also used to treat subclinical endometritis in bovines. Parikh *et al.* (2014) found a higher conception rate with Gentamicin than ceftiofur in repeat breeder Gir cows. Similarly, Parikh (2021) reported a 50% overall conception rate in Gir cows treated with levofloxacin for subclinical endometritis. However, antibiotic use may contribute to antimicrobial resistance, necessitating exploration of alternative approaches. Probiotics have emerged as a promising alternative, showing potential in preventing uterine infection and inflammation (Suthar *et al.*, 2022).

**Hormones:** Parikh *et al.* (2018) found that treating repeat breeder Gir cows with GnRH resulted in higher conception rates compared to hCG and progesterone therapy. Anbhule *et al.* (2019) observed increased conception rates in non-infectious repeat breeder cows treated with hCG five days after AI. Chaudhari *et al.* (2020) recommended screening cows for subclinical endometritis before starting hormonal therapy in the early postpartum period to improve reproductive performance in crossbred cattle.

**Immune-modulators:** An ideal immunomodulator should elicit an immune response, have low toxicity even at high doses, possess a short withdrawal period and minimal tissue residues, be compatible with other medications, be suitable for repeated administration, demonstrate defined biological activity, and lack teratogenic effects or adverse reactions. Various immunomodulators are employed for treating endometritis in dairy animals, each differing in efficacy rates. Commonly utilized immunomodulators include lipopolysaccharides (LPS) derived from *E. coli*, serum, plasma or hyperimmune serum, colostral whey, polymorphonuclear leukocyte (PMN) extracts and their constituents, bacteria-free filtrate, oyster glycogen, leukotriene B<sub>4</sub>, granulocyte-macrophage colony-stimulating factor and levamisole (Sarkar *et al.*, 2016).

***E. coli* LPS (100 µg in 30 mL sterile PBS)** prompts a higher influx of PMN cells and leucocyte inflammatory cells into the uterus, stimulating its defence mechanism against infection. Intrauterine infusion of *E. coli* LPS triggers the infiltration of neutrophils into the bovine uterine lumen, facilitating the clearance of bacteria from the uterus.

**Leukocytes enriched autologous plasma (50-100 mL for 3days)** resolves infection potentially due to the presence of complements and antibodies.

**Leukotriene B<sub>4</sub> (50 mL of 30nmol/L)** acts as a potent chemo-attractant, promoting the migration of PMNs into the uterine lumen.



**Oyster glycogen (10 mg/mL)** alleviates subclinical endometritis by reducing oxidative stress.

**Levamisole @ 2.5 mg/kg body weight** boosts cell-mediated immune response by enhancing the rate of T-lymphocyte differentiation.

Additionally, intrauterine proteolytic enzymes, such as trypsin, chymotrypsin and papain are utilized to resolve subclinical endometritis. These enzymes are considered as biological scalpels, possessing fibrinolytic and proteolytic activity in inflamed tissue, leading to the breakdown of products of infection, damaged cells and tissues.

**Ozone therapy:** serves as an alternate approach for treating subclinical endometritis (Zobel, 2013). It functions as a disinfectant, bactericidal agent, immune stimulator and possesses anti-inflammatory properties.

**Herbal therapy:** Various herbal remedies including garlic, neem, turmeric and ashwagandha have antibacterial, antifungal, anti-protozoal, antitumor, cytotoxic, anti-inflammatory and immuno-modulatory effects and are used for treatment of different ailments in dairy bovines (Sarkar *et al.*, 2016).

**Homeopathic treatment:** Fertisule- a homeopathic complex administered orally for 21 days, it restores normal reproductive rhythm in repeat breeder cows and buffaloes by stimulating gonadotropin secretions and ovarian activities (Chandel *et al.*, 2009).

**Acupuncture therapy:** reported as successful in mitigating the prevalence of repeat breeding syndrome in bovines according to Hosaha and Nakama (2002), showcasing the advancement in utilizing alternative medicines.

### Conclusion:

In conclusion, subclinical endometritis poses a significant challenge to dairy cattle reproductive health, leading to repeat breeding syndrome and economic losses for farmers. While conventional therapies have variable success rates, alternative approaches such as stimulating the uterine defense mechanism and utilizing phyto-medicines show promise in improving outcomes. Moving forward, continued research and implementation of these alternative treatments are crucial for effectively managing subclinical endometritis and enhancing dairy herd productivity.

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