



Efficacy of Ozone and Other Alternative Intrauterine Therapies in Infectious Repeat Breeder Cows

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ABSTRACT

The study was undertaken to evaluate the therapeutic efficacy of Ozone, *E. Coli* LPS, Autologous plasma, *Neem* oil, and Lugol's iodine in 100 infectious repeat breeder cows. The animals were divided in 5 different groups viz. Group-I, Group-II, Group-III, Group-IV and Group-V treated with Ozone @ 55µg/ml in 60ml distilled water, *E. Coli* LPS @100mcg in 30 ml sterile PBS, Autologous plasma @ 30 ml, *Neem* oil @ 10µg/ml in 30 ml distilled water, Lugol's iodine 1:25 in 30ml normal saline, intrauterine route in 20 cases, respectively, Group-V of 20 animals was kept as control. AI was done in recovered cases. On follow up, recovery rate in treatment group were found as 75.00, 80.00, 65.00, 75.00 and 50.00 per cent in groups I to V, respectively. The conception rate was found as 68.42, 73.68, 55.00, 63.15 and 53.33 per cent in cows in Group-I to V, respectively after one month on the basis of animal not shown the oestrus signs. Pregnancy rate calculated after two months by per rectal examination and was observed 65.00, 70.00, 50.00, 60.00 and 40.00 per cent cows from groups I to V, respectively. On conclusion, infectious repeat breeder cows treated with *E. Coli* LPS showed highest recovery rate, conception rate and pregnancy rate than the other treatment groups in this research study.

Key words: Intrauterine, repeat breeder, ozone.

How to cite :- Sawale, A. G., & Markandeya, N. M. (2023). Efficacy of Ozone and Other Alternative Intrauterine Therapies in Infectious Repeat Breeder Cows.

The Indian Journal of Animal Reproduction, 44(2), 51–54. 10.48165/ijar.2023.44.02.10

INTRODUCTION

Several herbs have antimicrobial potential, such as *Neem*, *Garlic*, *Ginger*, *Tulsi*, *Turmeric* and *Aloe Vera*. *Neem* (*Azadiracta indica*) has been widely used in India to treat multiple illnesses as a traditional ayurvedic medicine. In

infectious repeat breeder animal neem oil is used for intra-uterine infusion (Brahmanand, 2017). In the diagnosis of infectious repeat breeder cows, various therapeutic methods for managing infection and even inflammatory illness may be attempted. In contagious repeat breeder cows, the use of separate antibiotics and their combinations has been

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Received 30-08-2023; Accepted 12-12-2023

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widely used for many years (Mali *et al* 2020). The development of antibiotic resistance is a major challenge reduced phagocytic activity of polymorph nuclear (PMN) cells. Alternatively, antiseptics, ecobolics, chemicals, herbals, hormones were also tested. So, there is an urgent need to find out an alternative therapy for treatment of uterine infections by using natural substances as a means of activation of natural defence mechanism in the uterus. Use of certain plant products as a therapeutic agent has become a subject of recent scientific investigations.

Invasion of infection in the vaginal tract is a sign of a weak uterine defence system, and infection treatment focuses on strengthening the uterine defence system. In a biological sense, using antibiotics to fight infection is more expensive, but alternative strategies can greatly improve the body's immunological response. It is possible to improve natural body immunity with the help of immune modulators (Pupalwad 2021.) Recently, the alternative therapy proposed for the treatment of infection includes ozone preparations in the form of boluses, injections, foams, pearls, cream, palettes etc. (Djuricic *et al.*, 2015). According to recent publications, intrauterine ozone therapy may also be carried out in animals (Duricic *et al.*, 2014; Polat *et al.*, 2015). The present study is intended to study the efficacy in infectious repeat breeder cows of ozone, *E. Coli* LPS, autologous plasma, neem oil, and Lugol's iodine to suggest alternative, effective therapy.

MATERIALS AND METHODS

A total 100 repeat breeder cows were chosen for this research by per rectal examination with a history of normal oestrus cycles, apparently no palpable abnormalities of the reproductive tract, however they failed to conceive after three inseminations or natural services.

An eighty post-partum repeat breeder cows with more than five regular cycles were considered as chronic repeat breeders for current research. However, fourteen heifers repeating for less than five cycles were treated as fresh experimental cases. Grouping and different treatment protocols were used as per Table-1.

Table 1: Grouping of repeat breeder cows for different treatment protocols.

Sr. No.	Group	Treatment	No. Of Animals	Dose	Route	Schedule
I	OZ	Ozone	20	Ozone @55mcg/ml in 60 ml distilled water	IU	On the day of oestrus
II	ECO	<i>E. coli. LPS</i>	20	LPS@100mcg in 30 ml sterile PBS	IU	On the day of oestrus
III	AP	Autologous plasma	20	Autologous plasma @30 ml	IU	On the day of oestrus
IV	NO	Neem oil	20	Neem oil @10 mcg/ml in 30 ml distilled water	IU	On the day of oestrus
V	CON	Control	20	Lugol's iodine 1:25 in 30 ml normal saline	IU	On the day of oestrus

RESULTS & DISCUSSION

Group I

In Group-I (OZ), eleven cows were found to be conceived in recovered cases that were inseminated during normal oestrus on a non-return basis; it was noted that 11 (73.33%) of cows were successfully conceived following the initial insemination. When comparing the treatment group to the control group, the overall conception rate was determined to be 13 (68.42%) in the treatment group and 08 (53.33%) in the control group.

After two months of post insemination, the confirmed pregnancy in conceived animals was identified, and 13 animals were found to be pregnant. In the current trials, the pregnancy rate was evidently 13 (65.00%), compared to 9 animals were found to be pregnant and pregnancy rate was (45.00%) results in the control group. This finding is in agreement with (Duricic *et al.*, 2014) who reported higher conception rate in endometritic cows than control group after intrauterine ozone spray treatment. (Deori and Phookan. 2015) studied when ozone foam was administered to cows with metritis and endometritis, and found that the fertility of the cows improved. As a result, it may be an effective and alternative treatment for cows with metritis and endometritis. (Escandon *et al.*2020) reported first service conception rate increased (50.00%). In cross-bred dairy cows with bacterial infections, intrauterine treatment with ozone was more responsive (38/50, 76%) recovery rate respectively (Durrani *et al.* 2017). This finding was similar to present trial.

Group II

In the current study, *E. coli* LPS was utilised to treat new cases of infectious repeat breeder cows in Group-II (ECO). After treatment in next estrus 16 (80.00%) recovery observed. All recovered cases were inseminated properly. After two months of post insemination, the confirmed pregnancy in conceived animals was identified, and 14 animals were found to be pregnant. In the current trials, the pregnancy rate was evidently 14 (70.00%). This finding is in agreement with (Desai *et al.*, 2018) observed that

following *E. coli* LPS infusion, 80.00% animals were recovered. These findings are slightly higher than present research. It might be due to different physiology of animals, nutritional status and managemental factor. (Singh *et al.*, 2018) he reported that *E. coli* LPS used in intrauterine treatment, the cervico-vaginal mucus (CVM) found clear in 9 out of 12 cows 75% and showed no bacterial growth at the next estrus. This finding was slightly lower than present study. It might be due to physiology or nutritional changes. It was concluded that, administration of *E. coli* LPS as single intrauterine infusion in cows with bacterial endometritis, minimize the infection within one estrous cycle. (Bhuyan *et al.*, 2015).

Group III

Autologous plasma was treated in Group-III (AP). After treatment in next estrus 13 (65.00%) recovery observed. All recovered cases were inseminated properly. After two months of post insemination, the confirmed pregnancy in conceived animals was identified, and 10 animals were found to be pregnant. In the current trials, the pregnancy rate was evidently 10 (50.00%) and conception rate were 10 (55.00%). These findings are in agreement with (Sarma *et al.*, 2013) who reported 60.00% recovery and 50.00% conception rate in endometritic cows, respectively. (Sarkar *et al.*, 2018) who both reported 70.00 per cent conception rate in endometritic buffaloes and cow. This finding was slightly higher than present study, it could be due to physiological difference in cows.

Group IV

In group IV (NO), treated *Neem* oil resulted in the recovery of 15 (75.00%) of 20 cows from the treatment group, compared to 10 (50.00%) recovery in the control group. On a non-return basis, a total of 15 (75.00%) cows were discovered to be recovered cases that were inseminated at normal oestrus; it was documented that 12 (63.00%) were successfully conceived following the insemination. Twelve cows (60.00%) from the treatment group were discovered to be pregnant. (Chavan 2021) reported that the conception rate was 66.66% and (Pupalwad. 2021) reported that the recovery rate was 75.00%. These findings were similar with present study. *Neem* oil recovered 80.00% of buffaloes from uterine infections, with 67.00% conception rates, respectively. These findings suggest that *neem* oil could be used instead of antibiotics to treat endometritis (Kumar *et al.*, 2009). (Neeru *et al.*, 2009) reported how effective *neem* oil were treating endometritis in buffalo animals were administered *neem* oil three times at a 24-hour interval via intrauterine route. 80% recovery observed. These

findings were slightly higher than present study, it could be due to physiological difference in animals.

Group V

In control group V, 10 (50.00%) recovered, 08 (53.33%) conception and 08 (40.00%) pregnancy was seen. These findings are in agreement with (Asker *et al.*, 2021) reported 57.00%, (Bhardwaz *et al.*, 2018) stated that Lugol's Iodine-treated repeat breeder cross-bred cows had 40.00% pregnancy rate but higher result was reported by (Singh *et al.*, 2018) with recovery rate of 87.50% and conception rate of 42.86% and (Asfar *et al.*, 2020) reported recovery rates of 83.30% and conception rate 50.00%, This might be due to variation in uterine defence mechanism stimulatory effect of different Lugol's iodine concentration.

The efficacy of treatment was measured by the rate of recovery in infectious repeat breeding cows, as in all prior research cited, and it was observed that the efficacy of treatment was measured without distinguishing fresh and chronic grades. The details of comparative efficacy of different treatment protocols in repeat breeder cows (Table-2).

Table 2: Comparative details of efficacy of different therapeutic protocols in Infectious repeat breeding cows.

Sr	Treatment groups	Recovery rate %	Conception rate %	Pregnancy rate %
01.	OZ	75.00	68.42	65.00
02.	ECO	80.00	73.68	70.00
03.	AP	65.00	55.00	50.00
04.	NO	75.00	63.15	60.00
05.	CON	50.00	53.33	40.00

Finally, it should be emphasised that *E. coli* LPS and Ozone is the most effective treatment for cases of infectious repeat breeding cows produces the best institutional outcomes.

CONCLUSIONS

According to the findings, ozone treatment was just as effective as *E. coli* LPS treatment in cows with infectious repeat breeder cows. Ozone treatment has various advantages, such as its non-irritant composition, safety for drug residue in milk, prevention of possible bacterial resistance, and low cost, it may be a viable alternative to intrauterine antibiotics in dairy herds.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the Dean, College of Veterinary and Animal Sciences, MAFSU, Parbhani for

providing the necessary facilities for completion of this research work

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

- Asfar, A., Sofi, K. A., Fayaz, A., Bhat, M. A., Naikoo, M., & Rasool, S. (2020). Therapeutic evaluation of levofloxacin and lugol's iodine for subclinical endometritis. *J. Anim. Res.*, **10**(4): 623-627.
- Asker, A., Mansoor, A. R., Omar, A. A., and Majeed, A. F. (2021). Treatment of Postpartum Metritis in Dairy Cattle. *Med. Legal Update*, **21**(1): 1686-1688.
- Bhuyan, M., Nath, K. C., Deka, B. C., Bhuyan, D. and Goswami, S., (2015). Efficacy of E. coli LPS and oyster glycogen in terms of recovery and consequent conception rate in the treatment of metritis in cows. *Int. J. Recent Sci. Res.*, **6**(7): 5086-5088.
- Brahmanand (2017). Therapeutic management of repeat breeding due to sub-clinical endometritis in cattle using herbal plants. *Nanaji Deshmukh Veterinary Science University, Jabalpur*.
- Deori S. and A. Phookan, (2015). Bovine postpartum metritis and its therapeutics: a review. *J. Sci. Tech.*, **8**(23):1-5.
- Desai S. P., Sharma, V. K., Chauhan, P. M., Sutaria, T. V., Suthar B. N., and Mody, S. K., (2018). Gynaeco-clinical and physical properties of cervical mucus in repeat breeding crossbred cows following E. coli LPS therapy. *Ruminant Science*, **7** (1): 68-69.
- Djuricic D., Valpotic, H. and Samardzija M., (2015). The Intrauterine Treatment of the Retained Foetal Membrane in Dairy Goats by Ozone: Novel Alternative to Antibiotic Therapy. *Reprod. Domest. Anim.*, **50**: 236-239.
- Duricic D., Lipar, M. and Samardzija M., (2014). Ozone treatment of metritis and endometritis in Holstein cows. *Veterinarski Arhiv*, **84** (2): 103-110.
- Durrani A. Z., Raza, M. U. and Channa, A. A., (2017). An alternative therapy with ozone to avoid antimicrobial resistance (AMR) in uterine infections in dairy cattle. *Biomed. J. Sci. Tech. Res.*, **1**(3): 778-782.
- Escandon B. M., Espinozal, J. S., Perea, F. P., Quito, F., Ochoa, R., R.Lopez, R., Galarza, D. and Garzon, J. P., (2020). Intrauterine therapy with ozone reduces subclinical endometritis and improves reproductive performance in postpartum dairy cows. *Agriculture and Agricultural Science procedia*, **10**: 390-396.
- Kumar H., Bhooshan, N., Barman, P. and Yadav, M. C., (2009). Administration of herbal antimicrobials recover the endometritis in buffaloes. *Indian J. Anim. Sci.*, **79**:679-680.
- Mali, S. S., Amle, M. B., Khillare, K. P., Mali, A. B and Mhase, P. P. (2020). Efficacy of intrauterine ozone therapy in repeat breeder cows with subclinical uterine infection. *Haryana Veterinarian*, **59**(Special Issue):83-86.
- Neeru, B., Barman, P., & Yadav, M. C., (2009). Administration of herbal antimicrobials recovers the endometritis in buffaloes. *Indian J. Anim. Sci.*, **79**(7): 679-680.
- Polat, B., Cengiz, M., Çolak, A., & Cannazik, O. (2015). Comparison of intrauterine ozone and Rifaximine treatment in cows with subclinical endometritis. *Kafkas Univ. Vet. Fak. Derg.*, **21**(5):773-776.
- Pupalwad S. B. (2021). Studies on herbal ecobolic tablets along with garlic extract, neem oil, lugol's iodine and E. Coli LPS for intra-uterine therapy in infectious repeat breeder buffaloes. *M.V.Sc. thesis submitted to College of Veterinary and Animal Sciences, Parbhani*.
- Sarkar P., Kumar, H., Kumar, M., Patra and Mandal.D., (2018). Effect of administration of autologous plasma along with leucocytes on hormonal changes in relation to rate and conception in endometritic cows. *J. Anim. Res.*, **8**(6):1099-1103.
- Sarma, D. K., Balraj, S., Singh, M. P., Tiwary, B. K., and Sinha, M. P. (2013). Effect of intrauterine immunotherapy on uterine cellular dynamics and conception rate in endometritic cows. *Indian J. Anim. Reprod.*, **34**(2): 17-20.
- Singh B., Gupta, H. P., Shiv Prasad and Singh G. K. (2018). Effect of uterine defence modulation on recovery and conception rate in endometritic repeat breeding crossbred cows. *Int. J. Current Microbiol. Appl Sci.*, **7**:105-116.