PHYTOTHERAPY HAS POTENTIAL EQUIVALENT TO ANTIBIOTIC THERAPY FOR CLEARING THE ENDOMETRITIS IN CROSSBRED CATTLE

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Received: 20.10.2016 Accepted: 21.01.2017

ABSTRACT

Twenty-four endometritic-crossbred cattle were equally divided to receive, once a day, 15 ml normal saline, ciprofloxacin, neem or garlic as intrauterine treatment at estrus. At post-treatment estrus, the majority of cattle treated with antibiotic or herbal extracts had similar recovery ($p>0.05$) evidenced on the basis of clear mucus discharge, negative white side test and cervical mucus pH. Thus, the herbal extract therapy (phytotherapy) can be explored for the treatment of endometritis in crossbred cattle.

Keywords: Endometritis, Garlic, Neem, pH, White side test

The therapeutic approach for an endometritic cattle involves antibiotics, antiseptics or hormonal therapies that are costly, produce inconsistent results and require milk disposal. This warrants use of herbal preparations, called as phytotherapy, for uterine infection treatment through activation of uterine defense mechanisms. The medicinal herbs like neem (*Azadirachta indica*) and garlic (*Allium sativum*) had good success for the treatment of endometritis in cattle (Verma and Singh, 2008). One of the active principles of garlic is allicin, which has antimicrobial activities (Sadanandan *et al.*, 2014). Also, neem and garlic has immune-modulatory, anti-inflammatory, anti-fungal, anti-bacterial, anti-viral and anti-oxidant properties (Sadanandan *et al.*, 2014 and Subapriya and Nagini, 2005). Keeping in view these facts, the phytotherapy was proposed for the treatment of infectious endometritis in crossbred dairy cattle.

For the present study, the powdered leaves of *A. indica* or cloves of *A. sativum* in the absolute alcohol were heated in Soxhlet extraction heater until the colorless solvent started returning back to the reservoir. The absolute alcohol was redistilled from the extract and the residue was transferred to previously weighed petri dish and evaporated until it was free from alcohol. The yield in percentage was estimated by weighing the Petri dish again.

The crossbred cattle (n=24) diagnosed with endometritis by white side test and turbid color cervical mucus was selected for the present study. These animals (n=6 in each group) were subjected to receive once a day through intrauterine route either 15 ml normal saline, 15 ml ciprofloxacin, 15 ml neem extract or 15 ml garlic extract. Estrual cervical mucus samples were collected on the day of estrus before treatment and on subsequent estrus. The samples were subjected to colour, pH and fern pattern determination as well as white side test. The white side test is based upon the principle that the RNA present inside the nucleus of white blood cells react with 5% NaOH to produce the colour reaction. The normal discharge has less number of leukocytes to cause any change of colour, whereas, in clinical and subclinical cases of endometritis, discharge contains increased number of leukocytes causing a colour reaction. The statistical analysis was done using independent t-test and one way ANOVA.

The occurrence of clear cervical mucus was

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higher in normal (80%) than the repeat-breeding cattle (35.6%; Zaman *et al*., 2013). In the present study, during post-treatment estrus, the dairy cattle exhibited clear cervico-vaginal discharge in the ciprofloxacin group followed by garlic and neem group, respectively (p>0.05, Table 1).

Before instituting any treatment, the pH of estrual cervical mucus in all the groups was alkaline (>7.6, Table 1). In fact, the pH of estrual cervical mucus towards alkaline side is usually due to the presence of metabolites of bacteria and inflammatory exudates associated with uterine infection (Salphale *et al*., 1993 and Singla *et al*., 2004). In the present study, the decline (p>0.05) in pH was observed in all treatment groups at post-treatment estrus (Table 1). This reduction in pH may be due to decline in bacterial load and inflammatory process in uterus after treatment.

All the cattle selected for the present study were positive for white side test before intrauterine treatment (Table 1). During the post-treatment period, all the cattle subjected to ciprofloxacin treatment were negative; whereas only 16.7% (n=1/6) of herbal extract treated cattle were positive for white side test (Table 1). This proves the efficacy of herbal drugs to clear endometritis in crossbred cattle as reported earlier (Bhat *et al*., 2014). Thus, the anti-bacterial and immuno-modulatory properties of neem and garlic lead to reduction in bacterial load and subsequently inflammation process (Kumar *et al*., 2013 and Rahi *et al.,* 2013).

During post-treatment estrus, the crossbred cattle treated with either antibiotic or herbal therapy had similar efficacy for converting pre-treatment atypical fern pattern of cervical mucus to typical pattern (p>0.05, Table 1). In addition, in the present study, the majority of fertile estruses (81.8%) exhibited typical fern pattern, while majority of non-fertile estruses (55.6%) had atypical fern pattern of cervical mucus. These findings are in agreement with earlier studies (Modi *et al*., 2011). Thus, the atypical or nil fern pattern signifies unfavourable uterine environment which leads to blockade or damage of the sperm in the reproductive tract.

In brief, intrauterine infusion of neem or garlic extract, for seven days, can cure endometritis in crossbred cattle and subsequently improve the conception rate at par with ciprofloxacin infusion.

Table 1: The properties of estrual cervical vaginal mucus (CVM) before and after antibiotic or herbal therapy in crossbred cattle (n=6 in each group)

Parameter	Treatment		Control	Antibiotic	Neem	Garlic
Clear CVM	Pre		56.7%	61.7%	57.5%	52.5%
	Post		59.2%	93.0%	86.7%	88.3%
pH	Pre		7.73±0.25	7.83±0.23	8.05±0.26	8.26±0.21
	Post		7.60±0.28	7.26±0.19	7.23±0.48	7.05±0.46
White side test +ve	Pre		100%	100%	100%	100%
	Post		100%	0%	16.7%	16.7%
Fern Pattern	Pre	Typical	16.7%	0%	0%	16.7%
		Atypical	66.7%	50%	83.3%	66.7%
		Nil	16.7%	50%	16.7%	16.7%
	Post	Typical	16.7%	100%	83.3%	83.3%
		Atypical	66.7%	0%	16.7%	16.7%
		Nil	16.7%	0%	0%	0%

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