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### RESEARCH ARTICLE

## Comparative Clinical Efficacy of Allopathic, Homoeopathic and Herbal Treatments against Foot and Mouth Disease in Buffaloes

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### ABSTRACT

This study was made to investigate the comparative efficacy of three therapeutic systems (Allopathic, Homeopathic Phytotherapy) in foot-and-mouth disease (FMD) affected buffaloes (*Bubalus bubalis*) under field conditions in District Jhang, Pakistan. A total of 60 sick buffaloes were randomly divided into four equal groups named A, B, C and D. All the animals had been suffering from FMD and showing clinical signs for the last 1-2 days on an average. A single injection of Remacycline<sup>®</sup> L.A. (Oxytetracycline 200mg/ml, Merial International) was administered I/M @ 50 ml /animal of group A along with Boroglycerine paint twice a day in the mouth preceded by washing with KMnO<sub>4</sub> solution (1:5000). In Group B, merely a single Homoeopathic Injection FMT<sup>®</sup> (Hafiz Pharma Lala Musa, Gujrat) was given I/M @ 5 ml/animal. In Group C, 250 ml self-prepared Neem (*Azadirachta indica*) leaves' oil was drenched once daily for 3 days besides being anointed in oral cavity twice a day. Whereas, animals of group D were administered Normal saline @ 5 ml I/M for 3 days keeping it as control group. It was observed that all the animals in Group A began to eat fodder after 4 days and mouth wounds become partially healed. Milk yield was restored up to 25%. While, in Group B all the animals recovered in 1-2 days and started eating normally having completely desiccated mouth wounds along with normal gait. Milk production restored up to 75%. In Group C, animals started eating fodder in 3 days and mouth lesion had scabs along with complete cessation of drooling of saliva. Milk production was reduced to only 25% along with vanishing of limping. In group D, all animals remained unrecovered up to 10 days besides being affected with myiasis at feet lesions and productivity was there up to 10%. In short, it was concluded that Homeopathic treatment proved the best of all followed by Phytotherapy and Allopathy, respectively. Furthermore, Homeopathic therapy remained the most cost effective (Rs.40). Thus, Neem leaves' oil can be used with confidence as an alternative to both the other treatments against this crippling disease (FMD) in buffaloes.

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### INTRODUCTION

Foot and mouth disease (FMD) is one of the most contagious viral diseases of domestic artiodactyls including domestic and wild animals caused by FMD virus (FMDV), member of genus *Aphthovirus* of family

*Picornaviridae* (Belsham, 1993; Fauquet and Fargette, 2005). The evidence of high variability in genotype and phenotype of FMDV is exhibited as existence of seven antigenically distinct serotypes: A, O, C, Asia-1 and SAT 1-3 (Davies, 2002, Saiz et al., 2002). Pakistan is endemic with FMDV strains A, O and Aisa1 (Saeed et

al., 2010; Waheed et al., 2011). Office International des Epizooties (OIE) has placed FMD in the list 'A' of infectious diseases of animals. The disease is characterized by febrile conditions, lameness and vesicle formation on the mucus membranes of mouth, tongue, feet and teats of infected (female) animals (Coetzer et al., 1994; Alexandersen et al., 2003; Donaldson and Alexandersen, 2002) posing severe economic losses. The complications of FMD include secondary bacterial infection of lesions, hoof deformities, mastitis, permanent decrease in milk production and myocarditis. Clinical signs are more pronounced in cattle and lead to loss of weight and heat control (Anonymous, 2013). The transmissibility of FMD is extremely high (Mahy, 2005). Morbidity in susceptible animals reaches up to 100% and results in high economic losses. Average mortality is low in adult animals (1-5%). However, mortality is high among the young animals (20% or more). Acute myocarditis is the cause of mortality in young animals (Saiz et al., 2002; Alexandersen et al., 2003).

The incubation period for direct contact ranges from 2 to 14 days (Alexandersen et al., 2003). The incubation period for the spread of FMD infection within the farm is usually 2-14 days but may be as short as one day. The clinical signs range from mild or sub-clinical to severe and pronounced ones (Anonymous, 2013). In cattle and pigs, fever and viraemia usually start within 24-48 hrs. after epithelium infection, leading to viral spread into different organs and tissues with the production of vesicles in the mouth and feet. Stratum spinosum of epithelium is affected by the vesicles produced by FMDV. The acute phase of disease lasts about 1 week with subsequent strong humoral response (Salt, 1993).

For the purpose of treatment and control of FMD, the world has adopted three different ways including stamping out, vaccination with selected stamping out and vaccination only. The first two methods are adopted by strong economies having FMD free status. As Pakistan is a poor economy, the only option is vaccination of susceptible population along with the treatment of infected animals to prevent them from secondary bacterial infections and production losses by shortening the course of disease. In the field, there are three different approaches, with minor changes, practiced for the treatment of FMD infected animals including Allopathic, Homoeopathic and Herbal with variably claimed success rates. No study, to our knowledge, was conducted till the filing of this report to find the best efficacious method for early treatment of FMD to avoid the economic losses. For this purpose, the present study was designed to investigate these three treatment approaches to find the best clinically efficacious one.

## MATERIALS AND METHODS

### Animals

A total of 60 lactating buffaloes (1-3 months calving) were selected from four separate herds almost three kilometers distant from each other in the rural area at the periphery of the Tehsil Jhang city. Those were divided randomly into four equal groups viz. A, B, C and D during the recent outbreak of FMD in the months of Jan.-Feb., 2014. All the animals had been infecting with typical signs and lesions of FMD for the last 1-2 days on the average.

### Tentative diagnosis

Besides the clinical signs and history, 6 animals from each group were subjected to Foot and Mouth Disease virus antigen test (SVANODIP ® FMDV-Ag, Svanova Biotech AB, Uppsala Science Park, SE-751 83, Uppsala, Sweden) for getting it conformed. This kit was for the detection of FMDV antigen in swab and tissue samples only, but not for blood or serum.

### Treatment protocol

A broad spectrum antibiotic with the brand name of Remacycline ®-LA (Oxytetracycline 200 mg/ml, Merial International Pharmaceutical company) was administered I/M @ 50 ml per animal along with KMnO<sub>4</sub> solution (1:5000) mouth washing followed by 3% Boroglycerine anointed twice a day for 3 consecutive days to the animals of group A (Table 1).

For the animals of Group B, an injectable Homeopathic preparation namely Inj. FMT ® (Hafiz Homeopharma, Lalamusa Gujrat, Pakistan) containing Echinacea-Q, Kali Bich, Thuja, Belladonna-30 and Selecia-200) was administered once deep intramuscularly @ 5 ml per animal.

In group C, self-prepared Neem leaves' oil was used orally @ 250 ml Per Os once daily along with its smearing in the oral cavity before washing it with the lukewarm decoction of fresh Neem leaves (*Azadirachta indica*) twice a day for a span of 3 days. In group D, animals were administered with Normal saline (0.90% w/v NaCl) as a placebo at the dose rate of 5 ml I/M once daily for 3 days to satiate the sentiments of the owners under field condition.

### Neem Oil Preparation

One kg fresh Neem leaves along with four liters fresh tap water was added into a wide mouthed receptacle which was placed over stove and was boiled till water remained one liter followed by sifting through a muslin cloth to get decanted water in which one liter simple oil (Rape seed oil). This two liter mixture was boiled to that time when only one liter oil remained. It was let to be cooled while preserving into beverage emptied plastic bottles of variable capacities (Ali, 1989).

### Monitoring of Animals

All the animals of four groups were closely inspected daily to assess the extent of alleviation of sufferings (i.e., healing of mouth lesions, fodder intake, drooling

of saliva in the form of strings, rumination, milk production and extent of limping etc) for a period of 4 days.

## RESULTS AND DISCUSSION

The calamity of FMD prevails in both summer and winter season quite commonly in Punjab Province in spite of extensive vaccination programs using locally prepared vaccines to save the black gold of Pakistan from this highly infectious disease. But unfortunately, it is not coming up to the expectations of the stakeholders. This fact compels them to hinge upon the usage of imported vaccines like Aftibin<sup>®</sup> (Ghazi Brothers, Pvt. Pakistan) or others. On the other hand, the ignorance, illiteracy, lack of awareness, peasant community often makes mistake not to get their animals vaccinated against FMD so they have to pay a heavy price in the form of this disease (Chakrabarti, 2011). It is an open secret that there is no treatment for this ailment (Radostits et al., 2007) with the exception of symptomatic treatment employed in various systems of therapy with lofty claims i.e. Allopathic, Homeopathic and Indigenous system of medication (Hussain, 1988). Though immunotherapy using 1500 units anti-FMD complement fixing antibodies is considered as specific therapy (Muhammad, 2014) to induce complete recovery but premonition of hypersensitivity type-III reaction development commonly seen is hampering its widespread use among the FMD affected animals.

In the first group, antibiotic administered animals along with washing of mouth with KMnO<sub>4</sub> sol. followed by 3% Boroglycerine paint recovered in 4 days and productivity was restored up to 25%. This may be ascribed to the bactericidal or bacteriostatic effect of the drug over the lesions leading to rapid healing as well as checking the secondary bacterial infection since there is no virucidal drug launched for in both animals and human beings (Akhtar, 2005).

While in group B, Homeopathic injection showed a marvelous effect in normalizing the health and productivity in two days. This may be ascribed to antiviral effect of Echinacea-Q (Madrewar and Glencross, 1999) and anti-inflammatory action of Balladonna-30 (Hussain, 1988). Kali-Bich is used for thick, gluey or ropey discharges from the mucous membranes besides being desiccation of mouth lesions

in response to Selecia-200 containing in the injection (Hussain, 1988). Another ingredient of this product is *Thuja occidentalis* which possesses anti-viral, immunopharmacological characteristics such as stimulatory and co-stimulatory effects on cytokine and antibody production and activator of macrophages and other immunocompetent cells (Naser et al., 2005). This hastened the process of recovery in the shortest possible time (Table 1).

In group C, all the animals became normal in 3 days in response to the smearing of the Neem oil in mouth along with its Per Os administration. It may be due to the Antiviral, Anti-inflammatory, Antiseptic, Antipyretic, Antibacterial, alterative and rapid wound healing owing to lemenoids present as pharmacological active ingredients in the Neem oil (Awan, 2009; Anonymous, 2014) This indigenous therapy displayed its worth in a nice way by inducing recovery to the animals (Table 1). Besides it, concoction prepared from the bark of *Acacia arabica* (Desi kiker), *Albizia lebeck* (Shreen) is also got used by herbal healers to mouth wash and hooves for causing desiccation and decreasing the inflammation of lesions due to the presence of high tannin contents (Multani, 2010 and Multani, 2011). Neem tree is almost found everywhere in Punjab. Livestock owners may benefit from this to keep their animals healthy. It is also in line with the findings of Gakuya et al., (2011) and Purdas (2010) who got used soda ash solution (97% Sodium bicarbonate) for mouth washing followed by daily application of honey and finger millet flour on lesions leading to healing after three days. Similarly, another indigenous therapy was tried with great success in FMD effected animals in the form of "Mathan thailam" that contained coconut oil, jimson weed leaves (*Datura stramonium*) extract and copper sulphate (Mallady, 2014). In India, another liquid blend comprising turmeric, aloe vera, plam jaggery, common salt, garlic and coconut extract has been found quite effective while using @ 50 ml Per Os once daily for five days in cattle (Kathirval as cited by Mallady, 2014). In Control group, all animals did not recover up to 10 days besides being infected with maggot infested wounds in the interdigital spaces of the hooves making the animals crippled along with the very adverse effect on milk production that remained up to 10%. This may be ascribed to the invasion of secondary bacterial infection

**Table 1: The impact of different treatment protocols on the FMD affected buffaloes**

Groups of Buffaloes	Treatment Protocol	Recovery Period (Days)	Milk production Restoration (%)
A	Oxytetracycline-LA, KMnO <sub>4</sub> sol. & Boroglycerine paint	4	25
B	Inj. FMT I/M	1-2	75
C	Neem oil 250 ml P.O	3	75
D	Normal Saline 5 ml I/M for 3 days	Unrecovered for 10 days along with myiasis of wounds on the feet	10

and harboring of the flies over the wounds. Contrary to it, Aphocare ® powder (Square Pharmaceuticals, Ltd. Bangladesh) containing Vitamin C, 200 mg, Potassium Iodate, 100 mg and glutamic acid, 50 mg per 100 gms powder has been reported quite effective in expediting the mouth wound healing by using it @ 25 gm per Os for 5-7 days in buffaloes but it is worth mentioning that it is not available in Punjab province of Pakistan.

In conclusion, it was inferred that Homeopathic treatment remained more economical than indigenous method followed by allopathic therapy in ameliorating the Foot and Mouth disease in buffaloes.

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