

RETROSPECTIVE OBSERVATIONAL STUDY TO EXPLORE THE EFFECT OF AYURVEDIC *MODAKA* IN LUMPY SKIN DISEASE IN COWS

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ABSTRACT

Introduction: Lumpy skin disease (LSD) in cattle is a viral disease which causes fever and nodules on the skin and can even lead to death of cattle. In 2022 there was a widespread of this disease in 15 states of India out of which Rajasthan was among the worst hit state. So to create awareness among people about the measures that can be adopted and to decrease the death rate of cattle, we organized camps and distributed Ayurvedic *modaka* in Jaipur and areas nearby Jaipur.

Material and Method: 845 cattle were treated by ayurvedic *modaka* during the camps (10 camps) which were volunteered by students of National Institute of Ayurveda (NIA), Jaipur in various villages and *gaushala* in Jaipur. The *modaka* containing all herbal ingredients were prepared in NIA pharmacy and were distributed to people who had owned cows and they were provided complete guidance of internal and

external treatment of infected cows. The *modaka* were also given to healthy cows for boosting their immunity. **Results:** Follow up was taken for two weeks and the infected cows showed very good improvement in symptoms such as fever, loss of appetite, swollen lymph

nodes, nodular lesions on skin etc. Healthy cows were not affected with the disease as their immunity got improved and simultaneously their milk yield also improved. **Conclusion:** The Ayurvedic *modaka* prepared from herbal ingredients may be effective in curing lumpy skin disease in infected cows and maintaining immunity of healthy cows. Public awareness also increased regarding use of Ayurvedic preparations in this disease.

KEYWORDS: Lumpy skin disease, ayurvedic *modaka*, cows.

INTRODUCTION

Lumpy skin disease is the most infectious disease in cattle caused by a virus of family Poxviridae.^[1] World Organization for Animal Health categorizes LSD (Lumpy Skin Disease) as a notifiable disease.^[2] In 2022 there was a widespread of this disease in 15 states of India out of which Rajasthan was one of the worst hit state.^[3] As per the latest 20th livestock census, the cattle death in country due to LSD was more than 1.5 lakh out of which 70,000 cattle death were reported in Rajasthan, followed by Maharashtra and Punjab.^[4]

Cattle are considered as wealth and backbone of Indian society. The "cow culture" dominated Vedic life in India.^[5] Vedic people revered the cow and saw it as the source of their good fortune, pleasure, and health. Cattle's contribution to agriculture is so well understood.

Ayurveda, the holistic science has specifically emphasized the role of animal products both as diet and medicine. Ancient literature have scattered information regarding the disease and treatment of cattle and other animals like elephant and horses. As per the available literature the famous veterinary scholars are *Salihotra*, *Palakapya*, *Nakula* and *Sahadeva*.^[6]

In veterinary medicine, Ayurveda has historically prioritized animal welfare, therapeutic interventions, management, and surgery, according to the teachings. Physicians provided cures for both animals and humans in the Rigveda (c. 2000–4000 BC).^[7] Salihotra became the first person to be recognized as an animal healer, when he wrote Ayurveda Materia Medica in Veterinary Medicine and *Mrig* [animal] and *Hasti* [elephant] Ayurveda.^[8] The safety and effectiveness of Ayurvedic herbs and methods had been established over thousands of years of use. Most Ayurvedic herbs have been well studied and supported by clinical trials.

The lumpy skin disease virus (LSDV), a member of the genus Capripoxvirus (CaPV) under the family Poxviridae, is the culprit behind lumpy skin disease.^[9] The sheep pox virus

(SPPV) and goat pox virus (GTPV), which are closely related but phylogenetically distinct, are in the same genus as the lumpy skin disease virus.^[10] Viral transmission happens when livestock are moved. Animals with the infection had lesions on their skin, mucous membranes of their mouth, and secretions from their eyes and nose that could have contaminated communal feeding and drinking areas.^[11]

Natural mating or artificial insemination may expose females to the virus since it lingers in the semen of infected bulls.^[12] It is known that infected pregnant cows give birth to calves with skin lesions.^[13] Suckling calves may contract the virus from skin sores in the teats or from milk that has been contaminated with it. The virus can also be spread locally by blood-sucking insect vectors grazing on cattle.

Nasal discharge and lacrymation are the initial signs. The prefemoral and subscapular lymph nodes expand and are easily palpable. A high fever ($>40.50^{\circ}\text{C}$) can linger for around a week. Sharp decline in milk production. appearance of highly distinctive, 10–50 mm-diameter nodular cutaneous lesions.^[14] Lesions can range in number from a few in moderate cases to several lesions in animals with severe infection. The skin of the head, neck, perineum, genitalia, and limbs are preference sites. Nodules on the skin could last for several months. The cornea of one or both eyes can occasionally develop painful ulcerative lesions, which in the worst cases might result in blindness. Common side effects include pneumonia brought on by the virus itself or subsequent bacterial infections, and mastitis.^[15]

In Rajasthan, which witnessed the worst impact of the lumpy skin disease, it has led to reduced milk production, which lessened by about three to six lakh litres a day.^[16] Since it was an emergency condition and rajasthan government had issued some guidelines to cop up with emergency. So the *aushadhis* which were used in preparation of ayurvedic *modaka* were mentioned by rajasthan government and ashwagandha, guduchi, shatavari were added to increase the efficacy of ayurvedic *modaka*. These ayurvedic *modaka* were given in various camps conducted by NIA students to the people who owned cows.

MATERIALS AND METHODS

CAMPS

We had conducted 10 camps in rural areas of Jaipur district along with two *gaushala*. Ayurvedic *modaka* were distributed to the villagers who have owned cows and they were advised about internal and external treatment of infected cows. We also distributed pamphlets

which contained information regarding preparation of ayurvedic *modaka* and external application of infected cows.

The camps were volunteered by the students of NIA, Jaipur. Details of the camps with number of healthy cows and number of infected cows are mentioned in table no.1.

DRUGS

Internal use

Medicine was administered in form of *laddu/modak* and jaggery was used as base. Each 100 gm *laddu* contains herbal ingredients like *tulsi*, *dalcheeni*, *saunth*, *marich*, *ashwagandha*, *shatavari*, *guduchi* etc. mentioned in table no.2.

Dose of ayurvedic *modaka*: 3 *modaka* (each weighing 100 gms) in a day were given to all cows

Duration: 15 days

Follow up- for 15 days

Anupana: Ayurvedic *modaka* were mixed with the fodder of cattles.

METHOD OF PREPARATION OF MODAKA

The *modaka* were prepared in NIA pharmacy. All herbal ingredients excluding jaggery were taken in proper ratio and fine powder was prepared by passing through the pulveriser. Then the jaggery was dissolved in total liquids and evaporated over heat till it attained semisolid state. Then powder was incorporated and mixed thoroughly till a homogenous mass was obtained. Then the shape of *modaka* was given by hands. Each *modaka* weighed approx 100gm. When the mixture was little hot, *modaka (laddu)* were prepared of fist size measuring approx 100gm each.

External use

For infected cattles (with skin lesions) – People were advised to boil neem leaves in water and put *fitkari* and wash the infected wound of infected cattles. Then apply coconut oil prepared after boiling *neem* leaves, *tulsi* leaves, *mehandi* leaves, *lahsun* and *haldi* powder to it. They were also guided to take proper care of the hygiene of cows and keep them separate from healthy cows. The details were completely explained in pamphlets too which were given along with *modaka*.

DATA COLLECTION

While conducting camps in various villages and gaushalas in Jaipur the data was collected by enquiring from people about number of infected cows with lumpy skin disease and healthy cows. We observed symptoms like fever, loss of appetite, nasal discharge and lacrimation, mastitis, reduced milk production, nodular skin lesions, secondary bacterial infection with painful ulcerative lesions all over the body etc. in infected cows. The details of symptomatic distribution of lumpy skin disease in infected cows is given in table no. 3.

RESULT

The follow up was taken telephonically from the people who owned infected cows. After 15 days of the treatment to infected cows all the symptoms were markedly reduced as mentioned in table no.4. and graph no.1. When the treatment was started symptoms like fever and nasal discharge along with lacrimation were reduced within few days and the appetite of cows improved. The external treatment which was used in cows with nodular and ulcerative skin lesions along with internal treatment also proved very effective in reducing the agony of infected cows. In healthy cows when *modaka* were given for 15 days, they were not affected with disease and milk yield was also improved in them.

Table no. 1: Details of Camps.

S.no.	Date	Place	Diseased cows	Healthy cows	Total
1.	07/10/2022	Jaysinghpura khor, jaipur	40	20	60
2.	08/10/2022	Danth gaanv, amer jila, jaipur	30	15	45
3.	12/10/2022	Thikriya, ajmer road, jaipur	35	40	75
4.	13/10/2022	Thali, jamaramgarh, jaipur	30	20	50
5	17/10/2022	Haathi gaanv, kukkas amer, jaipur	50	30	80
6	18/10/2022	Roopnagar, kishangarh, jaipur	30	15	45
7	17/10/2022	Abhawas panchayat gaushala, jaipur	75	200	275
8	19/10/2022	Dantala gujran, jaipur	30	25	55
9	20/10/2022	Bhateri tehsil bassi, jaipur	40	20	60
10	24/10/2022	Laakhani panchayat gaushala, jaipur	40	60	100
		Total -	400	445	845

Table No. 2: Posology Ingredients of Ayurvedic *Modaka*.

S.no.	DRUG	BOTANICAL NAME	PART USED	QUANTITY
1.	<i>Tulsi</i>	<i>Ocimum sanctum</i> Linn.	<i>Patra</i>	10 gm
2.	<i>Dalcheeni</i>	<i>Cinnamomum zeylanicum</i> Beryn	Bark	5 gm
3.	<i>Saunth</i>	<i>Zingiber officinale</i> Roxb.	Rhizome	5 gm
4.	<i>Kali Mirch</i>	<i>Piper Nigrum</i> Linn.	Fruit	2 gm
5.	<i>Haldi</i>	<i>Curcuma longa</i> Linn.	Rhizome	5 gm

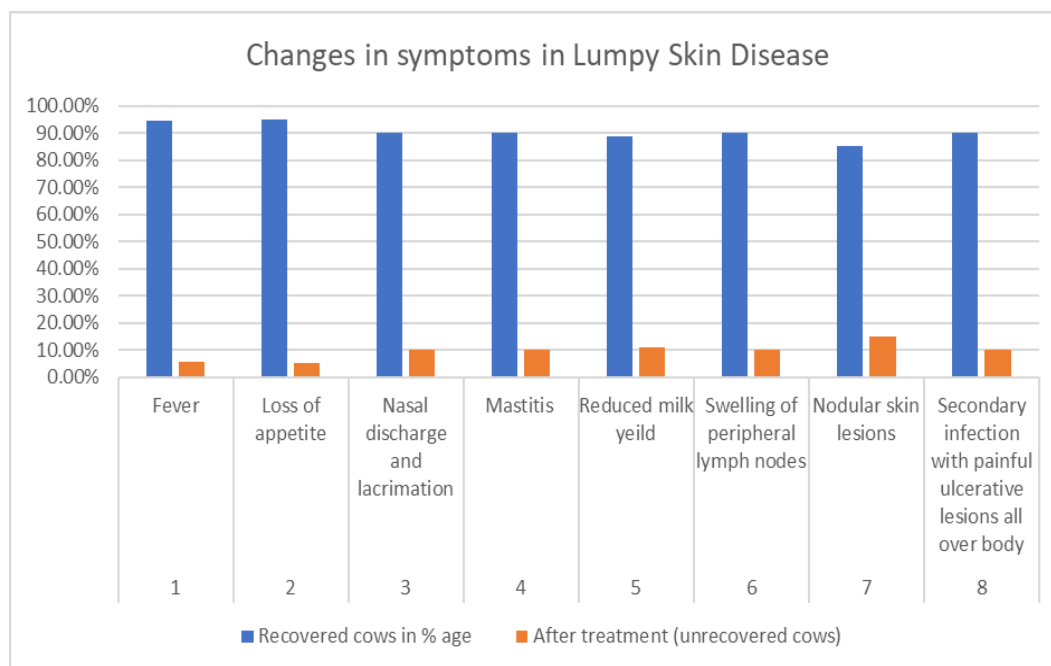
6.	<i>Dhaniya</i>	<i>Coriander Sativum</i>	Seed	2 gm
7.	<i>Ashwagandha</i>	<i>Withania Somnifera Linn.</i>	Root	10 gm
8.	<i>Shatavari</i>	<i>Asparagus racemosus Willd</i>	<i>Panchang</i>	3 gm
9.	<i>Guduchi</i>	<i>Tinospora cordifolia Willd</i>	Stem	8 gm
10.	Jaggery(<i>gudd</i>)	<i>Saccharum officinarum</i>		50 gm

Table 3: Symptomatic Distribution of Lumpy Skin Disease In Infected Cows.

S.no.	Signs and symptoms	No .of infected cows with the given symptom	Percentage in infected cattles
1.	Fever	360	90%
2.	Loss of appetite	400	100%
3.	Nasal discharge and lacrimation	340	85%
4.	Mastitis	320	80%
5.	Reduced milk yeild	360	90%
6.	Swelling of peripheral lymph nodes	300	75%
7.	Nodular skin lesions	300	75%
8.	Secondary infection with painful ulcerative lesions all over body	200	50%

Table No. 4: Improvement After Treatment To Infected Cows.

S .no.	Signs and symptoms	No. of recovered cows	Recovered cows in %age	After treatment (unrecovered cows)
1.	Fever	340	94.44%	5.56%
2.	Loss of appetite	380	95%	5%
3.	Nasal discharge and lacrimation	306	90%	10%
4.	Mastitis	288	90%	10%
5.	Reduced milk yeild	320	88.88%	11.12%
6.	Swelling of peripheral lymph nodes	270	90%	10%
7.	Nodular skin lesions	255	85%	15%
8.	Secondary infection with painful ulcerative lesions all over body	180	90%	10%



Graph No. 1: Changes in Symptoms In Lumpy Skin Disease In Infected Cows.



Figure 1: Making of Ayurvedic Modaka in NIA pharmacy.



Figure 2: Giving guidance to people in camp regarding Lumpy skin disease in cows with distribution of Ayurvedic Modak.



Figure 3: Camp at laakhni gaushala, Sikar, Rajasthan.



Figure 4: Infected cow with nodular lesion.



Figure 5: Cured cow after intake of Ayurvedic Modaka.



Figure 6: Camp at Jaysinghpura Khor Village, Jaipur.

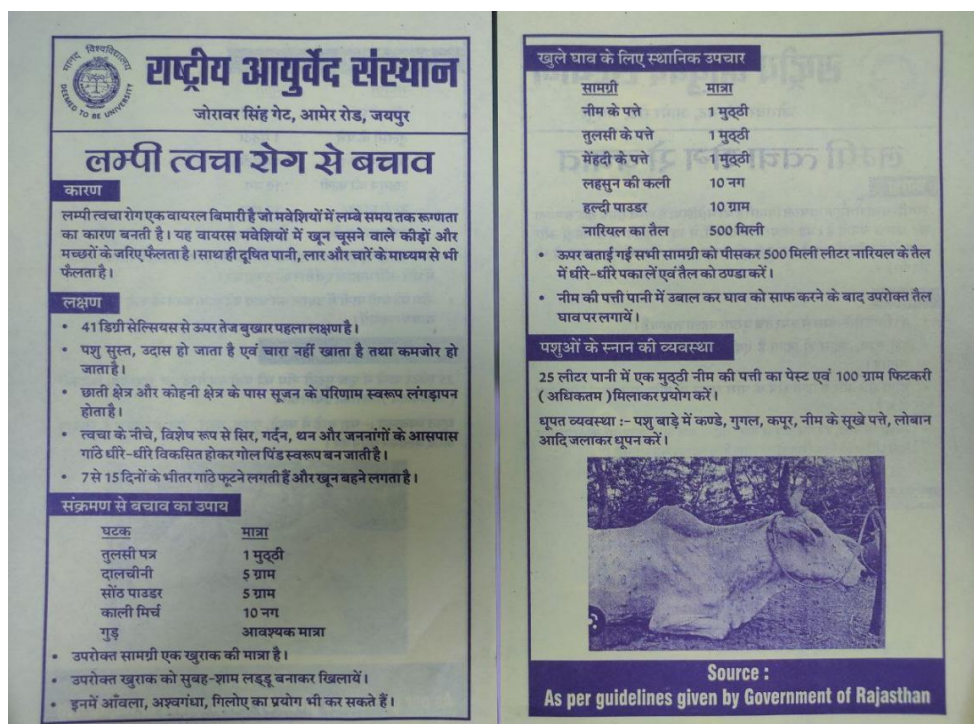


Figure 7: Pamphlet Containing Complete Information Distributed To General Public.

DISCUSSION

The ayurvedic *modak* were prepared from easily available herbs like *tulsi*, *haridra*, *maricha*, *guduchi*, *ashwagandha*, *shatavari*. *Tulsi* (*Ocimum sanctum* Linn.) has *jwarghna* and *krimighna* properties and acts well on *pranavaha srotasa*. On local application also it acts as

vedanasthapan, *shothahara*, *jantughana* and *tvagdoshahara*.^[17] Another important *dravya* is *Haridra* (*Curcuma longa* Linn.) which is mentioned as *vishaghna* and *kandughana* by *acharya charaka*.^[18] On local application it absorbs *pooya*, *kleda* and secretions from wounds and carries out *vranashodhana*. It also has anti-inflammatory and immunomodulator properties.^[19] The drugs like *maricha* (*Piper Nigrum* Linn.), *saunth* (*Zingiber officinale* Roxb.), *dalcheeni* (*Cinnamomum zeylanicum* Beryn) acts as *deepaniya* and useful in *agnimandiya*, *ajeerna* and is helpful in increasing appetite.^[20] *Guduchi* (*Tinospora cordifolia* Willd) is a drug of choice in *jeerna jwara* and *vishama jwara*.^[21] *Ashwagandha* (*Withania Somnifera* Linn.) has *brimhaneeya* effect and it nourishes the *dhatu*s and also has an antipyretic and analgesic properties.^[22] *Guduchi*, *ashwagandha* and *shatavari* give *rasayana* action and are *balya*.^[23] *Shatavari* (*Asparagus racemosus* Willd) is very effective in improving the milk yield as it has *stanyajanan* property.^[24] *Narikel* (*Cocos nucifera* Linn.) *taila* used in treatment of infected wounds has *dahashamak* and *vranropana* properties.^[25] And when it was applied with *vranashodhana* and *vednasthapan* drugs like *neem*, *tulsi*, *haridra* etc it proved very effective in curing the nodular skin lesions in infected cows.

Since there was no specific treatment in modern medicine for control of lumpy skin disease in cattles except goat pox vaccine, and ayurvedic herbs and modalities had been in use for thousands of years in curing diseases in animals. So the *modaka* prepared from herbal ingredients can be used to control spread of lumpy skin disease and decrease the mortality rate of infected cows.

CONCLUSION

Thus after fifteen days of treatment the signs and symptoms were markedly reduced in infected cows. The infected cattles with skin lesions showed very good improvement with external application of medicated coconut oil and intake of ayurvedic *modaka*.

In healthy cows when *modaka* were given for fifteen days, there was marked improvement in the immunity as they did not get affected with the disease. The milk production in healthy cattles was also improved.

Thus, we can conclude that ayurvedic *modaka* prepared from herbal ingredients may be effective in curing infected cows with lumpy skin disease and maintaining immunity of healthy cows.

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This work was financially supported by NIA Jaipur.

Conflicts of Interest

There are no conflicts of interest.

सारांश

परिचय- मवेशियों में मेलम्पीट्व चारोग एक वायरल बीमारी है जो बुखार और

त्वचा पर गांठ का कारण बनती है और यहाँ तक कि मवेशियों की मौत भी हो सकती है।

२०२२ में भारत के १५ राज्यों में इस बीमारी का व्यापक प्रसार हुआ, जिसमें से राजस्थान सबसे बुरी स्थिति में था।

इसलिए उन उपायों के बारे में लोगों के बीच जागरूकता पैदा करने के लिए जिन्हें अपनाया जा सकता है और मवेशि

यों की मृत्यु दर को कम करने के लिए, हमने शिविरों का आयोजन किया और जयपुर और जयपुर के आस-

पास के क्षेत्रों में आयुर्वेदिक मोदक वितरित किया। **विधियां-** ८४५ मवेशियों

का इलाज शिविरों के दौरान आयुर्वेदिक मोदक द्वारा किया गया था,

जो कि जयपुर के विभिन्न गांवों और गौशाला में *** छात्रों द्वारा आयोजित किए गए थे

। सभी हर्बल अवयवों वाले मोदक को ***

फार्मसी में तैयार किया गया था और उन लोगों को वितरित किया गया था जिनके पास गायों का स्वामित्व था और उ

न्हें संक्रमित गायों के आंतरिक और बाहरी उपचार का पूरा मार्गदर्शन प्रदान किया गया था।

स्वस्थ गायों को उनकी प्रतिरक्षा बढ़ाने के लिए भी मोदक दिया गया था। **परिणाम-**

दो सप्ताह के लिए अनुवर्ती कार्रवाई की गई और संक्रमित गायों ने बुखार, भूख न लगना, सूजन लिम्फनोइस,

त्वचा पर गांठदार घाव आदि जैसे लक्षणों में बहुत अच्छा सुधार दिखाया।

स्वस्थ गायें इस बीमारी से प्रभावित नहीं हुई क्योंकि उनकी प्रतिरक्षा में सुधार हुआ और साथ ही साथ उनके दूध देने

की क्षमता में भी सुधार हुआ। **निष्कर्ष-**

हर्बल अवयवों से तैयार आयुर्वेदिक मोदक संक्रमित गायों में मेलम्पीट्व चारोग का इलाज करने और स्वस्थ गायों की

प्रतिरक्षा बनाए रखने में प्रभावी हो सकता है।

इस बीमारी में आयुर्वेदिक मोदक के उपयोग बाहरी उपचार के बारे में सार्वजनिक जागरूकता भी बढ़ी।

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