# Maharashtra Animal and Fishery Sciences University, Nagpur

## Advisory: Revised Treatment protocol for management of Lumpy Skin Disease (LSD) in cattle

**No. MAFSU/Advisory -11/2023, Dated 17/08/2023**

- **Treatment and monitoring should be carried out strictly under veterinary supervision.**
- **Treatment protocol may be modified by attending veterinarian depending upon the clinical signs, condition of animal, severity of the case, concurrent disease conditions and results of laboratory investigations etc.**

**LSD, being a viral disease, there is no specific treatment,** however, symptomatic and supportive treatment based on the clinical signs, severity of case, condition of animal and concurrent disease conditions of patient should be carried out as per following guidelines.

### ISOLATION AND GENERAL MANAGEMENT OF AFFECTED ANIMAL:

- LSD affected animals should be separated from healthy animals and shall be kept in strict isolation UNDER MOSQUITO NET.
- Avoid free movement of LSD affected animals at local places, market, show etc.
- Prevent frequent visitors at stable having affected animals.
- **In-contact animals should be kept away from infected animals for a period of minimum 15 days.**
- Cleanliness of stable, animal to be maintained.
- Disposal of dung should be away from the stable.
- Fly repellent, insecticide spray can be used to control fly, mosquito, ticks etc.
- Bushes, and other insect habitats to be removed in order to keep environment clean and insect free.
- Proper disposal of Bio-waste viz. cotton, dressing materials, syringes, needles etc. by following standard procedures.
- Farms / shed / premises be regularly cleaned and disinfected with: Phenol (2%), Sodium hypochlorite (2 to 3%), iodine compound (1:33), quaternary ammonium compound (0.5%) (Any one).

- Early and regular therapeutic management helps in early recovery, prevention of relapse and favorable prognosis.
- Case to case assessment and regular monitoring of patient improves recovery rate.

- **Minimum drugs, maximum care, minimum pricks** after area rubbing / cleaned by using 70% alcohol (Clinical Spirit) with **new needle** and **minimum handling** will reduce the stress and hasten the recovery.
- Provision of energy/ fluid by parental route improves appetite and water intake in anorectic animals and / or palatable fodder can be offered.
- **Proper nursing and care of ailing animal by farmer is key for success**- Awareness of farmer in this regard is of utmost importance.
- Regular use of multivitamins, mineral supplements (with vit. C and zinc) and liver tonics hasten recovery and prevents deterioration of sub-acute cases.
- Liver and kidney dysfunctions are common, so unwanted and overzealous use of drugs especially by parenteral route be avoided
- Body condition, hydration status, recording temperature and individual data of animal need to be considered while considering any therapy. If urine output, biliary clearance or GIT function is upset, tailor-made dosages of antibiotic can be considered depending on individual case status.
- Mild cases usually recover within 3 days of treatment and Cases which doesn't recover within 3 days treatment needs to be clinically evaluated and appropriate investigations be carried out.

## Laboratory Investigations

**Following laboratory investigations should be carried out for diagnosis of LSD and its concurrent/co-morbid conditions and assessing the severity of the case.**

- Scabs, full thickness of skin biopsy by using 15 mm disposable punch under local anesthesia, saliva or nasal swabs in a sterile screw capped tubes with virus transport medium (VTM), blood, serum sample to be sent for LSD, Herpes etc. confirmation to the laboratory. Collected samples should be kept at 2–6$^{o}$C and must reach laboratory within 48 hrs. otherwise, samples should be stored frozen at -20$^{o}$C. Detailed Data recording of individual animal is must.
- If animal is vaccinated / unvaccinated, blood or sera samples to be submitted to laboratory to get antibodies status.
- CBC and Blood smear examination for diagnosis of haemoprotozoan infection (if temperature is 104$^{o}$F and above) - better on first day before institution of treatment
- LFT (Total, direct and indirect bilirubin, Total serum protein, albumin)
- KFT (BUN, Creatinine)
- In case of bleeding : clotting time, PT aPTT, fibrinogen, FDP, d-Dimer etc. along with CBC.
- ABST (Nasal discharge swab in pneumonia, Ulcerative lesions/wound swab/ milk in case of mastitis) in suspected secondary bacterial infections.
- Faecal Sample examination for parasitic eggs to assess worm load.

## Clinical and Therapeutic Management

**Clinical examination is important prior to therapy and Clinical data be recorded.**

1) **Clinical Nutrition, Nursing, Care and Management during illness as well as during convalescent period:** As proper nutrition and nursing of ailing animals is playing key role in hastening recovery and preventing relapse major thrust be given on these aspects by clinicians
   - Provide *ad lib* clean drinking water at least 4 to 5 times in a day or electrolyte water orally.
   - Water intake can be increased by giving lukewarm drinking water in cool hours of the day as well as by adding salt and small quantity of jaggery in drinking water.
   - Provide palatable, soft and easily digestible green fodder.
   - Hand feeding/ providing fodder at higher place if animal is unable to eat from ground due to painful lymphatic/nodular swellings over neck and shoulder.
   - Give good quality concentrates (energy / protein supplements)
   - Provide Multivitamin (with zinc and Vit. C) and Mineral supplements through feed/water
   - Give Immunoboosters, Herbal Liver Tonics through feed/water
   - Oral haematinics in anaemic animals for at least three weeks
   - Appetizers and pre and probiotics are useful to restore rumen ecology.
   - Keep animal housed at clean, warm and dry place to protect from cold, rains and hot sun light.
   - Provide warmth to ailing animals by covering with blankets and providing high wattage bulbs in animal shed.

**Drenching should be avoided. Oral medicines/ supplements be given through treacle- jaggery/ cereal flour**

2) **Management of Dehydration/ Negative energy balance:**
- In prolonged anorexia, dehydration with negative energy balance: Slow Intravenous administration of Dextrose 25% may be considered (0.5 to 1gm per kg body weight as per requirements).
- Inj. NS, DNS, RL intravenously may be given as per requirement.

Avoid fluids in case of respiratory distress/ Pulmonary oedema

3) **In case of high non -responding fever:**
- Cold water splashing, sponging over the body and forehead is also useful or spray the animal with chilled water to reduce temperature.
- Record temperature at 10 min intervals to avoid hypothermia.
- Stop cooling /spraying when temperature is 1$^{o}$F above baseline. Pat dry.
- Inj. Paracetamol may be given @10 mg/ kg iv/im or may be given orally twice daily in calves.

**4) In case of painful limb/brisket swellings, difficulty in sitting, prolonged standing, lameness and recumbency:**

- Fomentation/sponging with warm saturated common salt solution / Magnesium Sulphate followed by application of Magnesium sulphate (ground powder) -glycerin paste over swelling is highly useful.
- In case of painful lymphatic swellings, Inj. Meloxicam + Paracetamol or Nimesulide + Paracetamol @1 ml/20 kg im may be given for 2-3 days.
- In case of severe soft edematous swelling on legs, brisket and dewlap as an accompaniment of lymphatic swelling, 1-2 doses of Inj. Furosemide may be given @ 1 mg/kg b. wt. im (Contraindicated in dehydration).
- In case of recumbency, provide soft and dry bedding, frequent changing of the sides, helping animals to stand with support at least twice daily, or can be kept on slings intermittently to avoid ischemic complications, fomentation of legs etc.

**5) Methylene blue treatment:**

- Oral treatment with 0.1% Methylene Blue (MB) solution (1 gram of MB powder in 1 liter of water) may be considered by the Veterinarian. Dose- Adult cows (350 Kg body weight): 300 ml at 8 hourly interval (thrice in a day) for 4 days. *Calf: give approx. half dose- (@ 1mg/kg body weight thrice day). MB solution/preparations may also be used topically (e.g. by spray).
- A milk withholding interval of 96 hours and a meat withdrawal interval of 14 days (if used in meat producing animals).

**6) Anti-histaminics-** Inj. Chlorpheniramine maleate@ 0.25 mg/kg (1 ml/40 kg b. wt.) im may be given for 2-3 days in case of cutaneous nodular lesions as per need.

**7) Antibiotics** may be given for 3 days in case of secondary bacterial infections- cellulitis, pneumonia, purulent wounds etc. Antibiotics can be chosen on the basis of ABST, culture and sensitivity and tailor-made in light of body condition and abnormalities depending on underlying cause.

DON'T FORGET, INDISCRIMINATE USE OF ANTIBIOTICS MAY LEAD TO RESISTANCE. THUS, JUDICIOUS USE OF ANTIBIOTICS IS REQUIRED.

**8) If respiratory distress:**

- In case of URT/ nasal ulcerations /lesions and blockage of nasal passage because of abundant thick mucus:
  - Clean nasal passage with clean cotton or soft cloth soaked in luke warm saline/water.
  - Apply boroglycerine at excoriated areas, instillation of few drops of nasal decongestant in external nares
  - Steam inhalation/Steamer: 2-4 drops of eucalyptus oil/vicks in Hot water may be given
- In case of bronchospasm (Bronchodilators and loop acting diuretics**):** Inj. Deriphylline @ 8-10 ml slow im BID (adult animal dose) (avoid if tachycardia).
- In case of pulmonary oedema 1-2 doses of Inj. Furosemide@1-2 mg per kg may be given (Be sure there should not be any dehydration). Pneumonia is usually observed on $3^{rd}$ –$4^{th}$ day in calves whereas on $6^{th}$ -$8^{th}$ day in adult cattle.

**9) Corticosteroids:** In critical cases, Inj. Dexamethasone may be used in tapering doses (Contraindicated in advance pregnant animals and Case should be monitored for haemoprotozoan infections during and following therapy).

Avoid use of Corticosteroid along with NSAID

**10) Management of clotting cascade with severe coagulopathies/ Disseminated Intravascular Coagulation (DIC):**

- Use of styptics viz. Carbazochrome Salicylate can be considered in case of mild bleeding/prolonged blood clotting time.
- If delayed clotting time i.e. more than 15-17 min, initially replace calcium if hypocalcemia and intravenous protein preparations can be given. If no stabilization of clotting time: aminocaproic acid can be considered with caution and need to monitor clotting parameters closely at 10 minutes intervals to avoid complications of hypercoagulation, thromboembolism.
- If early or fast clotting i.e. less than 3 minutes, fluid therapy with NS 0.9% iv and Heparin subcutaneously provided there should not be any petechiation or ecchymoses or gross bleeding and melena.

**11) Management of mouth and ocular lesions:**

- **In case of ulcerative mouth lesions**, give mouth wash with PP lotion (light violate color) followed by application of boroglycerine.
- **In case of ocular lesions/lacrimation,** cleaning and irrigating eyes with luke warm water (if sticky discharge) or boric acid solution
- **For mild corneal oedema/opacity-** 5% sodium chloride (Hypersol 5%) eye drops twice daily and Antibiotic eye drops (if required) three times in a day.
- **For severe cases of corneal opacity-** Gentamycin 0.5 ml + Dexamethasone 0.5ml sub-conjunctively with 26G needle to be injected after proper restraint for 3- 5 days. Vit. A preparations may be given.

  **Note:** corticosteroids are contraindicated in corneal ulcers.

**12) Management of wounds:**

- **Fresh open wound:** First wash it with 0.1% PP lotion ($KMNO_4$ solution) & apply Povidine iodine/Iodine solution/Povidone powder. Cover it with loose cotton bandage and Repeat dressing daily till it heals completely.
- **Purulent wound:** First wash it with 0.1% PP lotion ($KMNO_4$ solution) followed by cleaning with Hydrogen peroxide (20 volume). Apply Magnesium sulphate + glycerin paste or iodine powder & cover it with loose cotton bandage.
- **For continuous oozing wounds:** Application of Zinc oxide/ any other antiseptic powder daily till complete healing.
- **Deep wounds:** Wash the wound thoroughly with 0.1% PP lotion ($KMNO_4$ solution), apply Magnesium sulphate + glycerin as a paste in wound cavity and Cover the whole wound with cotton bandage daily till wound heals.
- **Maggoted wounds:** Apply Turpentine oil by cotton swab, remove the maggots & dress by using fly repellent bid till complete wound healing. Inj Ivermectin @1ml/ 50 kg body weight s/c only once may be considered
- **General treatment for wounds**
- Apply fly repellent twice daily on surrounding areas of all types of wounds.
- Multivitamins -Micro mineral feed supplements should be given regularly.
- Inj. Ascorbic acid may be given @10 mg/ kg iv daily for 2-3 days to promote wound healing.

**In case of wounds** daily dressing till complete cure. To prevent contamination of wounds, animals must be kept on dry floor, Clean and hygienic environment.

**13) Non-specific therapy:**

- **Auto-haemotherapy** may be used with caution. Standard procedure to be followed. (Avoid in conditions like lymphaedema, lymphadenitis and swelling and monitor for side effects/complications like pyrexia, hypersensitivity, acute or delayed reactions in cases).

**14) Management of haemoprotozoan infections-Common concurrent/ Co-morbid conditions:** (Blood smear be taken on very first day before institution of treatment. If blood smear is positive and Hb is progressively decreasing < 8 gm/dl). Such cases can be treated for specific cause.

**Anti-haemoprotozoan Drug therapy**:

- In case of LSD with Theileriosis Inj. Buparvaquone @ 2.5 mg/kg b. wt. (1 ml/20 kg b. wt.) im single dose
- In case of LSD with Anaplasmosis Inj. Oxytetracycline (LA) @20 mg/kg b. wt. deep im single dose
- In case of LSD with Babesiosis /Surra, Inj. Diminazine Aceturate @ 3.5-7.0 mg/ kg b. wt. deep im single dose
- **Haematinics:** Iron preparations orally for 20 days and Vitamin B-complex parentally for 5-6 days.
- **Blood transfusion** from healthy cow /bull / Bullock (of same species) of other healthy farm may prove beneficial in anaemic animals after major and minor cross match / compatibilities by following standard procedures.

***Semen should not be collected and processed for frozen.***

**References:**


- LSD Control and treatment Advisories/guidelines by the Animal Husbandry Commissioner, Government of India, Ministry of Fisheries, Animal Husbandry & Dairying, Department of Animal Husbandry and Dairying, New Delhi vide letter Reference No. D.O No. K-l 1053/69/20r9-LH, Dated: 31/08/2022
- Recommendation of the Maharashtra Animal and Fishery Sciences University, Nagpur- 19th Joint Animal Science Research Council 2021-22 on Project entitled “Prevalence and Therapeutic management of Lumpy Skin Disease (LSD) in cattle by A. U. Bhikane, S. P. Waghmare, K. S. Pajai and R. I. Hatzade, PGIVAS, Akola.
- Field experience of University experts and Field veterinarians



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