DIRECTORATE OF HEALTH SERVICES
24x7 DISASTER CONTROL ROOM

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TREATMENT GUIDELINES FOR LEPTOSPIROSIS

AT THE PRIMARY CARE INSTITUTIONS

All people coming from flood affected areas or those who have visited flood affected areas presenting with fever, headache, myalgia with or without diarrhoea to be immediately started on Tab DOXYCYCLINE 100mg 1-0-1 for 7 days.

Those patients with red flag signs like tachypnoea [>24/min], tachycardia out of proportion to fever [IF HR>10 for every 1 ^{0}F rise in temp], hypotension [sys BP <100 mm of Hg], cold clammy extremities, altered sensorium, jaundice, oliguria or haemorrhagic manifestations need to be referred to higher centres. **Patient should be auscultated for lung crepitations as early warning for lung involvement.**

Those patients without red flag signs send back on doxycycline, should be followed up daily and asked to report back in case of red flag signs.

All pregnant ladies and those with co-morbidities like uncontrolled diabetes mellitus, cirrhosis, chronic kidney disease, coronary artery disease, COPD, HIV, malignancies, haematologic disorders, those on steroids or other immunosuppressants must be referred to a higher center.

AT THE SECONDARY CARE/THQ LEVEL

Inj. Crystalline Penicillin is to be started immediately at a dosage of 20 Lakh Units Q6H Intravenously after a test dose. For children, 3 to 4 lakh units/kg/day divided into 6 hours intravenously. First dose of Inj. CP is to be given as a supervised dose with patient in the supine position [i.e. with emergency drugs, cannula, AEFI kit etc. in place]

In case of past history of Penicillin anaphylaxis or in case of positive skin test, alternative is INJ Ceftriaxone 1 gm IV BD after negative skin test. For children, Ceftriaxone 100 mg/kg/day divided into 2 doses at 12 hourly intervals may be given.

In case of positive skin test to Ceftriaxone, alternatives are IV Azithromycin 500 mg for 5 days or IV Doxycycline 200 mg IV loading dose and 100 mg IV BD for 7 days.

FROM SECONDARY CARE/THQ PATIENTS SHOULD BE REFERRED TO HIGHER CENTRES IN CASE OF

1. Hypotension [SBP<100 mg/Hg] with disproportionate increase in heart rate [HR>10 FOR every 1 °F rise in temperature], cold clammy extremities, diaphoresis—consider Myocarditis and refer.

2. Tachypnoea [>30/min], hypoxemia [spo2 <90% despite continuous oxygen], chest signs—consider ARDS and refer.

3. Progressively deepening jaundice or if INR >1.5—Refer.

4. Oliguria not responding to fluid challenge [1 L NS to be infused over 30 min provided there is no clinical evidence of myocarditis]—consider AKI and refer.

5. Hemoptysis, melena, upper GI Bleed, menorrhagia, spontaneous gum bleed—refer.

6. Alteration of sensorium persisting after correction of electrolytes and after ruling out CNS haemorrhage -to be referred.

INVESTIGATIONS TO BE DONE AT CHC/THQ LEVEL.

1. Hb, TC, DC, ESR, PLC.

2. RBS, LFT, RFT, Na, K

3. In case of oliguria and severe myalgia—send CPK.

4. Routine urine examination

5. In case of worsening jaundice—send PT/INR.

6. In case of haemorrhagic manifestations—PLC, Peripheral smear, PT/INR, APTT.

7. Thrombocytopenia with altered sensorium—CT BRAIN PLAIN.

8. In case of hypotension with relative tachycardia—Troponins [TROP T, TROP I in case of kidney injury].

9. Severe epigastric pain—send Lipase to rule out pancreatitis.

10. Rule out other Tropical fever syndromes [Dengue, malaria, scrub typhus, Enteric fever, H1N1].

[IN THE POST FLOOD SCENARIO, TREATMENT OF LEPTOSPIROSIS HAS TO BE BASED ON CLINICAL FEATURES ALONE.LAB TESTING IS FOR SURVEILLANCE PURPOSE ONLY.MOREOVER LEPTO ELISA/CARD TEST WILL BECOME POSITIVE ONLY AFTER 7 DAYS.]

LEPTOSPIROSIS TREATMENT GUIDELINES FOR TERTIARY CARE CENTERS

1. Any patient coming to the OPD/Emergency department with acute febrile illness with/without myalgia, headache ± diarrhoea especially in patients from flood affected area or those who have visited flood affected area or exposed to contaminated water should be provisionally diagnosed as possible leptospirosis and should be started on Tab DOXYCYCLINE 100 MG 1-0-1 for 7 days.

2. If there are any of the red flag signs or symptoms like tachypnoea [>24/min], tachycardia disproportionate to fever [rise in HR >10 for 1 °F rise in temperature], hypotension [SBP<100 mm of Hg], jaundice, alteration of sensorium, oliguria, haemorrhagic manifestation – patients should be admitted and initiated on INJ CRYSTALLINE PENICILLIN 20 Lakh Units Intravenous 6 hourly FOR 7 DAYS after negative skin test.

Red flag signs

1	tachypnoea [>24/min]
2	tachycardia disproportionate to fever [rise in HR >10 for 1 °F rise in temperature]
3	hypotension [SBP<100 mm of Hg]
4	jaundice
5	alteration of sensorium
6	oliguria
7	haemorrhagic manifestation

3. In case of previous history of anaphylaxis to Inj. Crystalline penicillin or in case of positive skin test, Inj. Ceftriaxone 1 gm IV BD for 7 days may be used instead of Crystalline penicillin after skin test.

4. In case of positive skin test to Inj. Ceftriaxone, intravenous Doxycycline 200mg loading dose followed by 100mg IV 12th hourly or IV Azithromycin [500 mg IV OD for 5 days] may be used as alternative.

ONCE ADMITTED

Focused investigations should be done to rule out

1. Myocarditis
2. ARDS
3. Hepatitis
4. Acute kidney Injury.
5. Pancreatitis
6. Myositis/Rhabdomyolysis.
7. Aseptic Meningitis.
8. Acalculous cholecystitis.
9. Disseminated Intravascular Coagulation

- Investigations to rule out other tropical fever syndromes must be sent [Dengue, malaria, enteric fever, scrub typhus, H1N1].
- Two sets of blood cultures must be sent to rule out bacterial sepsis.
- Patients with myocarditis, ARDS/Severe Pulmonary Haemorrhage Syndrome [pulmonary leptospirosis] should ideally be admitted to an ICU/HDU.

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<u>IVC ASSESSMENT FOR FLUID RESPONSIVENESS</u>

In spontaneously breathing patients, following measurements suggest fluid responsiveness

a. IVC measuring <2 cm in diameter coupled with IVC collapse >50% with each breath or

b. IVC collapsibility >12%

In mechanically ventilated patients, IVC Collapsibility >18% suggest fluid responsiveness.

COAGULOPATHY, THROMBOCYTOPENIA

Coagulopathy and thrombocytopenia need to be corrected in case of spontaneous bleeding manifestations.

ACUTE KIDNEY INJURY

Pre-renal AKI should be corrected by Normal saline, if there is no clinical/echo/biochemical evidence of myocarditis.

In order to shorten door- to dialysis time, early Nephrology consultation should be sought.

Ventilatory management of Diffuse Alveolar Haemorrhage in Leptospirosis.

1. Identify acute respiratory failure early:
2. Clinical: Tachypnoea, use of accessory muscles, intercostals indrawing, diaphoresis

   ABG: PaO_2 <60 with FiO_2>0.5:CO_2 retention with respiratory acidosis.
3. Shift to ICU.
4. Manage as ARDS:

   Intubation and mechanical ventilation.

   NIV only for mild ARDS [P/F 200-300].

Volume control or pressure control lung protective ventilation-

Plateau pressure <30 cm H_2O.Start with tidal volume of 6ml per Kg—decrease to 4 ml/kg if plateau pressure is >30 cm H_2O.

Set FiO_2 to keep SpO_2 88 to 94.

Adjust respiratory rate according to $PaCO_2$ [max RR 35].

PEEP: According to ARDS net protocol or adjust to a PEEP with good oxygenation and no adverse hemodynamic effects.

5. Care of endotracheal tube— frequent suctioning to clear haemorrhage.

6. Consider muscle relaxants if Pplat >30 cm of H2O in spite of optimal ventilator settings.

7. Prone ventilation—consider prone ventilation if P/F <150 in spite of optimal ventilator settings. Permissive hypercapnia with PH> 7.2 is ideal.

Antibiotic	**Dose for normal renal function**	**Dose for renal failure Estimated creatinine clearance ml/min**		
		50-90	10-50	<10
Amoxicillin	500mg Q6h or 1gm Q8h	Q8h	Q12h	Q24h
Ampicillin	0.5-1gm Q8h	Q6h	Q6-12h	Q12-24h
Azithromycin dehydrate	500mg OD	No dose adjustment		
Cefotaxime	1gm Q6h	Q 8-12h	Q12-24	Q24h
Ceftriaxone	1gm Q12h	No dose adjustment		
Doxycycline	100mg BID	No dose adjustment		
Penicillin G	2 MU Q6h	No dose adjustment		

Prepared by The State Advisory Group on Leptospirosis Management