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# Treatment protocol for ERGOTISM

**1. Stop all medications** which are suspected to be the cause of ergotism

**2. IV fluid:** adequate volume status. If the patient develops rhabdomyolysis, alkalinization of urine might be considered.

3. **Monitoring:**

3.1) CBC, BUN/Creatinine, Electrolyte, LFT (at least AST/ALT)

3.2) EKG 12 leads

3.3) Post reperfusion injury:

A: Rhabdomyolysis: Serum K, CPK, (it may cause acute kidney injury)

B: Compartment syndrome

**4. Pain control and keep warm all extremities**

Analgesics and/or opioids as necessary: morphine 0.03-0.1 mg/kg/dose, IV or IM or SC repeat as required every 2-4 hours.

**5. Acute severe limb ischemia**

5.1) **ARTERIAL DILATORS:** sodium nitroprusside, or nitroglycerine, or nicardipine are the vasodilators of choice. Nitroglycerine is preferred if coronary spasm is suspected.

5.1.1 **Sodium nitroprusside** (dilution and infusion rate as shown in **Table 1**), dose:

*Adult:* 1-10 mcg/kg/min until reperfusion is achieved or systemic hypotension occurs

*Infant:* 0.5-1 mcg/kg/min may be administered and the infants monitored closely for metabolic acidosis and tachyphylaxis.

If sodium nitroprusside IV > 4 mcg/kg/min longer than 12 hours or >8-10 mcg/kg/min a few hours; **sodium thiosulfate 1.0 gm per for every 100 mg sodium nitroprusside** should be added.

5.1.2 **Nitroglycerine**, dose:

*Adult:* 10-20 mcg/min and increase by 5-10 mcg/min every 5 to 10 minutes. Maximum rate 200 mcg/min until is achieved or systemic hypotension occurs

*Pediatric* (older ≥29 days): 1-5 mcg/kg/min continuous IV infusion. Maximum dose is 60 mcg/kg/min.

**Table1.** Infusion rate (mL/hour) to achieve dosing of nitroprusside 1-10 mcg/kg/min

| 5%dextrose water | 250 mL | | 500 mL | | 1000 mL | |
|---|---|---|---|---|---|---|
| Nitroprusside | 50 mg | | 50 mg | | 50 mg | |
| (nitroprusside conc) | (200 mcg/mL) | | (100 mcg/mL) | | (50 mcg/mL ) | |
| Na thiosulfate | 500 mg | | 500 mg | | 500 mg | |
| Patient weight (kg) | 1 mcg/kg/min | 10 mcg/kg/min | 1 mcg/kg/min | 10 mcg/kg/min | 1 mcg/kg/min | 10 mcg/kg/min |
| 10 | 3 | 30 | 6 | 60 | 12 | 120 |
| 20 | 6 | 60 | 12 | 120 | 24 | 240 |
| 30 | 9 | 90 | 18 | 180 | 36 | 360 |
| 40 | 12 | 120 | 24 | 240 | 48 | 480 |
| 50 | 15 | 150 | 30 | 300 | 60 | 600 |
| 60 | 18 | 180 | 36 | 360 | 72 | 720 |
| 70 | 21 | 210 | 42 | 420 | 84 | 840 |
| 80 | 24 | 240 | 48 | 480 | 96 | 960 |
| 90 | 27 | 270 | 54 | 540 | 108 | 1080 |
| 100 | 30 | 300 | 60 | 600 | 120 | 1200 |

5.1.3 **Nicardipine**, dose:

*Adult:* 5 mg/hr initially may be increased by 2.5 mg/hr every 15 minutes not to exceed 15 mg/hr

5.1.4 **Nifedipine** may be added. Dose: 5-10 mg orally three times a day.

5.2) **ANTICOAGULANTS**: Either heparin sodium or low molecular weight heparin.

5.2.1 **Heparin sodium** (Heparin 5,000 unit in 0.9% Sodium chloride injection 100 mL)

Dose: - Initial dose: 80 units/kg IV bolus

- Maintenance dose: 18 units/kg/hr

- Serial activated partial prothrombin time (aPTT) q 6 hr and adjust heparin dosage as recommended in the aPTT-Based Dosage Adjustment (**Table 2**). This Table

provide protocols for unfractionated heparin (UFH) dosage adjustments based on activated partial prothrombin time (aPTT). All therapeutic aPTT ranges should be adapted to the responsiveness of the reagent and coagulometer.

**Table 2.** The aPTT-Based Dosage Adjustment

| aPTT after the initial dose (sec) | Dose of heparin |
|---|---|
| < 35 | Add another 80 units/kg bolus, then increase 4 units/kg/hr |
| 35 - 45 | Add another 40 units/kg bolus, then increase 2 units/kg/hr |
| 46 - 70 | No Change |
| 71 - 90 | Decrease infusion rate by 2 units/kg/hr |
| > 90 | Hold infusion 1 hr, then decrease rate by 3 units/kg/hr |

5.2.2 **Low Molecular Weight Heparin (LMWH),** dose 1 mg/kg SC q 12 hr

If CrCl < 30 mL/min: 1 mg/kg q 24 hr

If CrCl < 15 mL/min: consider unfractionated heparin (UFH) instead, if possible.

**6. After the reperfusion and the signs and symptoms resolved**, one of the following oral vasodilators may be continued (based on symptoms/clinical conditions)

6.1) Nifedipine:10 mg orally three times a day OR

6.2) Captopril: 50 mg orally three times a day OR

6.3) Prazosin: 1 to 3 mg/day

These drugs are also use in the case of less severe acute or chronic peripheral ischemia caused by chronic therapy.