**STATEMENT OF COMMITMENT AND POLICY**

Hypertensive disorders of pregnancy are serious and have the potential to cause end organ dysfunction. Responding to adverse conditions appropriately may help prevent the onset of severe complications and lead to a better maternal and fetal outcome.

**ROLES AND RESPONSIBILITIES**

*Physicians, Midwives, Obstetrical and ER Nurses.*

**APPLICATION**

This policy applies to any woman who presents to the maternal child unit or the emergency department with preeclampsia or eclampsia.

**OVERVIEW**

Magnesium Sulphate is ***not*** an antihypertensive. Its use is recommended only for seizure prophylaxis and seizure treatment in women who have severe preeclampsia/eclampsia. Blood pressure is not always a reliable predictor for the risk of seizures. Phenytoin and benzodiazepines **should not** be used for seizure prophylaxis or treatment of a seizure unless there is a contraindication to MgS04 or it is not effective. Our goal is the prevention and/or control of seizures in women who present with preeclampsia and/or eclampsia.

**PROCEDURE**

Magnesium Sulphate for seizure prophylaxis should be considered for women with:

* Severe hypertension (SBP>160mmHG/ DBP >110mmHg)
* HELLP syndrome
* Secondary prevention after eclamptic seizure
* BP below severe hypertension but with associated significant headache or clonus, visual disturbances, RUQ pain, or progressive renal insufficiency.

Magnesium sulphate is used for the treatment of preeclamptic seizures.

**Supplies**:

The supplies needed for hypertensive disorders of pregnancy are stored in medication cart in the Preeclampsia/Eclampsia Kit. In order to mix a bolus and/or a continuous infusion of MgSO4 you will need the following supplies:

* Magnesium Sulphate, ampules contain 5 Grams /10ml
* Calcium Gluconate, ampules contain 1 gram/10ml (10% solution)
* Normal Saline 100ml, 500ml bags or D5W 100ml, 500ml bags
* Syringes 5ml, 10ml and 20ml
* Blunt needles #18
* IV volumetric pump, pump tubing, primary line and secondary line
* 20 gauge spinal needles, 21.5 or 23 gauge IM needles
* Reflex hammer

**Mixing of MgSO4 BOLUS- 4 Grams:**

Withdraw 8ml of MgSO4 from an ampule (=4grams), then add this to a 100ml bag of normal saline or D5W. You may use either normal saline or D5W to dilute the bolus. Total volume is 108ml. Label appropriately. Run via infusion pump over 20-30 minutes or @324ml/hr.

**Mixing of MgSO4 Continuous Infusion- 1 Gram /Hr**

Withdraw 20ml of MgSO4 from 2 ampules (=10grams), then add this to 500ml of normal saline. Total volume is 520ml. Run via infusion pump @ 1G/Hr or @52ml/hr.

**IM Dose 10 Grams**

If IV access is not available or if the patient is going to be transferred out then MgSO4 may be given intramuscularly. Give 5 Grams by deep IM injection to the upper, outer quadrant of both buttocks (10 gram total) with 3 inch, 20 gauge spinal needles. Then give 5 Gram IM Q4H through same technique.

Depending on the patient’s size you may choose an appropriate size needle, 21.5 or 23 gauge, typically used for an intramuscular injection to give the IM injection. Apply needle to 5ml syringe to give required dose in each buttock.

**\*High Alert medication, nursing independent double check required\***

**Management and Monitoring:**

Physician assessment and ordering of preeclampsia profile. Serum magnesium levels do not need to be monitored.

An obstetrical nurse will provide one to one nursing care for a preeclamptic/eclamptic patient. The nurse will monitor the following:

* BP, P, RR with oximetry and FHR Q5 minutes during bolus dose of MgSO4.
* BP, P, RR with oximetry and FHR Q15-30 minutes or as ordered during continuous MgSO4 infusion.
* Accurate input/output (foley catheter with urometer, output> 30ml/hr).
* Check patellar or brachial reflexes when MgSO4 bolus complete and then Q30-60 minutes or as ordered by physician.
* Level of consciousness with orientation to person, place and time.
* Continuous EFM.
* Development of side effects

The nurse monitoring the patient will notify the physician if; output <30ml/hr, uncontrolled BP, decreased level of consciousness, respiratory rate of less than 12 breaths per minute, oximetry <95%, muscle twitching, loss of patellar or brachial reflexes, or if a seizure occurs. The nurse will also notify physician if any atypical or abnormal fetal heart rate patterns.

Reflex Scale

4+ very brisk; often associated with clonus

3+ brisker than average and possible but not necessarily indicative of disease

2+ average; normal

1+ somewhat diminished; low normal

0 flat, no response

The disappearance of the patellar reflex is an early clinical sign to detect hypermagnesemia. The serum levels when a patient loses patellar reflexes is between 4-5 mmol/l and when respiratory depression occurs serum levels are >6mmol/l.

Women at risk of seizure activity should be treated with MgSo4 during labor and for the first 24 hours following delivery.

Excess magnesium in the newborn is most likely to occur when MgSO4 is administered parenterally for 24 hours or more. Observe for hypermagnesemia in the newborn which usually manifests itself as a weak or absent cry, flaccidity, hypo-reflexion and respiratory depression. Supportive care of the newborn will be provided and transport of the neonate will be done as needed.

**Antidote**

Immediate nursing response when hypermagnesemia occurs is calling for help, turn off MgSO4, place patient on side, maintain airway and assist ventilations as required.

The antidote is 1 gram of Calcium Gluconate (10ml of a 10% solution). The antidote is readily available in the Preeclampsia/Eclampsia Kit and if respiratory depression occurs give 10 ml calcium gluconate IV direct over 3 minutes with a physician present.

**DEFINITIONS**

Hypermagnesemia is a serum magnesium concentration > 2.6 mg/dL (> 1.05 mmol/L). Symptoms include weakness, nausea, vomiting, hypotension, respiratory depression, and cardiac arrest.

**REFERENCES**

Hypertensive Disorders of Pregnancy and Magnesium Sulphate Teaching Package, Woodstock Hospital, January 2016

Perinatal Manual of Southwestern Ontario, Chapter 15, October 2018.

SBGHC IV Manual, Magnesium Sulphate, January 2019.

SOGC Clinical Practice Guidelines; Diagnosis, Evaluation and Management of the Hypertensive Disorders of Pregnancy: Executive Summary. JOGC May 2014.

 SOGC MOREOB Program 2018, pp 1- 23.

Appendix 1 Preeclampsia/Eclampsia Kit, Antihypertensive Treatment (Forms)