Special Articles

Is Magnesium Sulfate for Prevention or only Therapeutic in Preeclampsia?

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Intravenously administered magnesium sulfate is effective in reducing the incidence of eclampsia in women with severe preeclampsia. However, the routine use of magnesium sulfate in all cases of preeclampsia is not justified as the incidence of eclampsia is likely to be lower in milder cases than in those with severe disease, and also in view of the adverse effects of magnesium sulfate. Magnesium sulfate should be considered for women with preeclampsia for whom there is concern about the risk of eclampsia, such as hyperreflexia, frontal headache, blurred vision, and epigastric tenderness. As it is an inexpensive drug, it is especially suitable for use in low income countries. Intravenous administration is preferable, where there are appropriate resources, as side effects and injection site problems seem lower. Duration of treatment should not normally exceed 24 hours, and if the intravenous route is used for maintenance therapy the dose should not exceed 1 g/hour. Serum monitoring is not necessary. Clinical monitoring of respiration, tendon reflexes and urine out put are enough for monitoring of magnesium toxicity. Administration and clinical monitoring of magnesium sulfate can be done by medical, a midwife or nursing staff, provided they are appropriately trained. However, the use of magnesium sulfate should not be misconstrued as a license for reduced surveillance of preeclamptic women. Progression from mild to severe disease and development of serious maternal complications during antepartum, intrapartum and postpartum cannot be predicted without close maternal surveillance. Therefore, continued close antepartum, intrapartum, and postpartum surveillance is crucial for optimal maternal and perinatal outcomes.

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The goal of treatment in preeclampsia is to prevent eclamptic seizures and their resultant morbidity whereas, in eclamptic patients, the goal is to treat and prevent recurrent seizures. The use of magnesium sulfate ($MgSO_4$) in obstetrics has consistently aroused controversy despite many years of experience with its use. Magnesium sulfate was first used to prevent eclamptic seizures in 1906 by Horn in Germany, who injected it intrathecally. An intramuscular regimen was used in 1926 to prevent recurrent seizures in women with eclampsia and the drug was given intravenously in 1933 to women with preeclampsia and eclampsia[1]. Despite such early suggestions of its potential to treat and prevent recurrent eclamptic seizures, the choice of magnesium sulfate for seizure prophylaxis has continued to vary enormously. In the United States magnesium sulfate is the antconvulsant of choice for women with either eclampsia or severe preeclampsia, while in the United Kingdom in 1992 it was used by only 2% of obstetricians[2]. Over the years the use of magnesium sulfate for preeclampsia and eclampsia was deemed more an institutional experience than a scientifically established treatment. The Collaborative Eclampsia Trial has provided irrefutable evidence of the superiority of magnesium sulfate when compared with diazepam and phenytoin in the treatment of seizures and prevention of recurrent seizures in women with eclampsia[3]. This finding has had a considerable impact on clinical practice, and increasingly magnesium sulfate is being used for treatment of eclampsia. In a recent survey in the UK and Ireland, 60% of clinicians reported using magnesium sulfate for treatment of eclamptic seizures[4]. However, there is no consensus

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about the best way to prevent the condition, which patients should receive such prophylactic therapy, or whether prophylaxis is really indicated at all in mild and severe preeclampsia. In addition, some obstetricians believe that magnesium sulfate is safe for both mother and fetus, others have questioned the efficacy of magnesium sulfate as a prophylactic agent, and have expressed concern at its potentially lethal maternal and fetal side effects.

The purpose of the present article was to review the available evidence of magnesium sulfate concerning efficacy, benefits and risks of seizure therapy and prophylaxis in women with eclampsia and preeclampsia.

Definition and classification[5]

Mild preeclampsia is defined as a systolic blood pressure (BP) of at least 140 mmHg and/or a diastolic BP of at least 90 mmHg on at least two occasions at least 6 hours apart after the 20th week of gestation in women known to be normotensive before pregnancy and before 20 weeks' gestation plus proteinuria (300 mg or more per 24-hour period). If 24-hour urine collection is not available, then proteinuria is defined as a concentration of at least 30 mg/dL (at least 1+ on dipstick) in at least two random urine samples collected at least 6 hours apart.

Severe preeclampsia is defined as sustained elevations in systolic BP to at least 160 mmHg and/or in diastolic BP to at least 110 mmHg for at least 6 hours in association with abnormal proteinuria or if there is hypertension in association with severe proteinuria (at least 5 g per 24-hour period). In addition, preeclampsia is considered severe in the presence of multiorgan involvement such as pulmonary edema, oliguria (less than 500 mL per 24-hour period), thrombocytopenia (platelet count less than 100,000/mm^3), abnormal liver enzymes in association with persistent epigastric or right upper quadrant pain, or persistent severe central nervous system symptoms (altered mental status, headaches, blurred vision or blindness).

Eclampsia is the occurrence of seizures in a woman with preeclampsia that cannot be attributed to other causes. The seizures are grand mal and may appear before, during, or after labor. Seizures that develop more than 48 hours postpartum may be encountered up to 10 days postpartum.

Magnesium sulfate in eclampsia

The general aims of treatment in eclampsia are stopping the convulsions and preventing further fits which are associated with reduction in adverse outcome. There is strong evidence that magnesium sulfate is the drug of choice for treatment of eclamptic seizures and also for prevention of recurrent seizures in eclampsia. Chien et al[6] in 1996 carried out a systematic quantitative overview of the evidence from randomized trials of magnesium sulfate in the treatment of eclampsia (n = 1,743) and preeclampsia (n = 2,390) which varied in severity and concluded that magnesium sulfate was more effective than other interventions in preventing recurrent seizures in eclampsia and in preventing the first seizure in preeclampsia. Duley et al[7] conducted a meta-analysis of all randomized trials comparing magnesium sulfate with diazepam for women with a clinical diagnosis of eclampsia. Seven trials involving 1,441 women were included. They found that magnesium sulfate was associated with a reduction in maternal death when compared to diazepam [relative risk (RR) 0.59, 95% confidence interval (CI) 0.37 to 0.94]. There was also a substantial reduction in the risk recurrence of further fits (RR 0.44, 95% CI 0.34 to 0.57). There were few differences in any other measures of outcome, except for fewer Apgar scores less than seven at five minutes (RR 0.72, 95% CI 0.55 to 0.94) and fewer babies with a length of stay in a special care baby unit more than seven days (RR 0.66, 95% CI 0.46 to 0.95) associated with magnesium sulfate. Duley et al[8] also performed a meta-analysis to assess the effects of magnesium sulfate compared with phenytoin when used for the care of women with eclampsia. Six trials involving 897 women were included. They found that magnesium sulfate was associated with a substantial reduction in the recurrence of convulsions when compared to phenytoin (RR 0.31, 95% CI 0.20 to 0.47). The trend in maternal mortality is also in favor of magnesium sulfate. These benefits of magnesium sulfate when compared with phenytoin are also reflected in reductions in other measures of maternal and perinatal morbidity. Data from the Magpie Trial[9] also support evidence that magnesium sulfate alone should be used for women with eclampsia: both to control the seizure and to prevent recurrence.

In conclusion, the evidence from most randomized trials favors magnesium sulfate for management in women with eclampsia[6-11]. Therefore, magnesium sulfate is now the gold standard against which any new anticonvulsants for women with eclampsia should be compared in properly designed randomized trials.

Magnesium sulfate in severe preeclampsia

Hall et al[12] reported a case series of 318 women with preeclampsia (blood pressure ≥ 140/90 mm Hg and ≥ 2+ proteinuria) who were not in labor. In their management protocol, clinical evaluation of the pregnant women with careful blood pressure control was performed; magnesium sulfate was not administered for seizure prophylaxis even in the presence of imminent eclampsia such as very high blood pressure (≥ 160/110 mmHg), headache, visual disturbance, and epigastric discomfort. They found that 1.5% of the women developed eclampsia. There are 3 large randomized controlled trials comparing the use of magnesium sulfate to prevent convulsions in patients with severe preeclampsia (the Coetzee trial[13], the Magpie trial[9] and the Belfort trial[14]). Coetzee et al[13] performed a randomized controlled trial of intravenous magnesium sulfate versus placebo in the management of 699 women with severe pre-eclampsia. They found that of 345 women who received magnesium sulfate, one developed eclampsia (0.3%); in the placebo group, 11/340 women (3.2%) developed eclampsia (RR 0.09; 95%CI 0.01 to 0.69; p = 0.003). Therefore, in their trial eclampsia occurred 11 times less often in women with severe preeclampsia treated in a special care tertiary unit when magnesium sulfate was administered. Data from the Magpie Trial[9] which enrolled 10,141 women with preeclampsia (26% had severe preclampsia and 16% imminent eclampsia) showed that the women allocated magnesium sulfate had a 58% lower risk of eclampsia than those allocated a placebo. The trial by Belfort et al[14] compared the use of magnesium sulfate with nimodipine, a calcium channel blocker with cerebral vasodilatory effects. In this trial the authors enrolled 1,650 women who were given study drugs during labor and for 24 hours postpartum at 14 sites in 8 countries. All the study women had well defined clinical characteristics before randomization[14]. The authors found a significant reduction in the rate of eclampsia in the magnesium sulfate group (7 of 831 vs 21 of 819 in nimodipine group; p = 0.01); most of the difference was caused by a lower eclampsia rate in the postpartum period among the group assigned magnesium sulfate (0 of 831 vs 9 of 819 in nimodipine group; p = 0.01).

In conclusion, according to the large randomized controlled trials[9,13,14], the use of intravenous magnesium sulfate in the management of women with severe preeclampsia significantly reduced the development of eclampsia.

Magnesium sulfate in mild preeclampsia

Should magnesium sulfate be administered to women with mild preeclampsia? This is an enigmatic question that plagues obstetricians constantly. As previously mentioned, the primary objective of magnesium sulfate prophylaxis in women with preeclampsia is to prevent or reduce the rate of eclampsia and complications associated with eclampsia. Secondary benefits also include reduced maternal and perinatal mortalities and morbidities, even in women who do not develop convulsions. In addition, in women with mild preeclampsia, a secondary benefit could be a reduction in the rate of progression to severe pre-eclampsia[15]. The large Magpie Trial[9] showed that magnesium sulfate reduced the risk of eclampsia in women with preeclampsia, but it did not address mild preeclampsia. There are only 2 double-blind placebo-controlled trials evaluating the use of magnesium sulfate in patients with well-defined mild preeclampsia (blood pressure of at least 140/90 mmHg taken on two occasions in the presence of new onset proteinuria). The first trial performed by Witlin et al[16], women with a diagnosis of mild preeclampsia at term were randomized to receive standard therapy during labor and for 12 hours post partum with either magnesium sulfate (n = 67) or a matching placebo solution (n = 68). They found that no difference was observed in the progression to severe preeclampsia in both groups. The second larger trial was conducted by Livingston et al[17]. They randomized total of 222 women with mild preeclampsia to receive intravenous magnesium sulfate (n = 109) or matched placebo (n = 113). They found that there was no difference in the percentage of women who progressed to severe preeclampsia or in maternal or infant outcomes. However, the problem with these studies is that the number of patients enrolled was too few. The power, therefore, was too low for valid conclusions. There were no eclamptic seizures in either group, but the likelihood of eclampsia was low. A much large number of patients needs to be studied before the effectiveness or safety of magnesium sulfate for prevention of disease progression in women with mild preeclampsia can be stated with certainty. Therefore, the routine use of magnesium sulfate for seizure prophylaxis in women with mild preeclampsia is not recommended at present.

Pharmacology and toxicology of magnesium sulfate [1,11,15,17]

Magnesium sulfate USP is $MgSO_4$, H_2O and not $MgSO_4$. Parenterally administered magnesium is

cleared almost totally by renal excretion, and magnesium intoxication is avoided by ensuring that urine output is adequate, the patellar or biceps reflex is present, and there is no respiratory depression. Eclamptic convulsions are almost always prevented by plasma magnesium levels maintained at 4 to 7 mEq/L (4.8 to 8.4 mg/dL or 2.0 to 3.5 mmol/L). Patellar reflexes disappear when the plasma magnesium level reaches 10 mEq/L (12 mg/dL). This sign serves to warn of impending magnesium toxicity. When plasma levels rise above 10 mEq/L, respiratory depression develops, and at 12 mEq/L or more, respiratory paralysis and arrest follow. Current evidence is conflicting about the mode or site of action of magnesium sulfate, both central nervous system-specific and systemic mechanisms have been proposed even though the cause of eclamptic seizures has not been definitely established. Based on a number of studies, as well as extensive clinical observation, magnesium most likely exerts a specific anticonvulsant action on the cerebral cortex. Typically, the mother stops seizures after the initial administration of magnesium sulfate, and within an hour or two regains consciousness sufficiently to be oriented as to place and time. It has been found that magnesium sulfate suppressed electroencephalographic seizures induced by hyperbaric oxygen in rats and as this occurred with an intact blood-brain barrier, therefore, magnesium might work through calcium-regulated intraneural enzymatic processes that alter neuronal excitability and produce seizures. In addition, it has been shown that magnesium can block hippocampal seizures. Hippocamus region is a region with a low seizure threshold and a high density of N-methyl-D-aspartate receptors. Therefore, it is believed that this implicated the N-methyl-D-aspartate receptors in eclamptic convulsion. Systemic effects of magnesium include vasodilation and increase in endothelium-derived relaxing factor. Thus, magnesium decreased systemic vascular resistance and mean arterial pressure, and at the same time increased cardiac output without evidence of myocardial depression. Intense vasospasm in the central nervous system may also be the cause of seizures in eclampsia. Magnesium sulfate is a potent vasodilator, especially in the cerebral vasculature, and the administration of magnesium sulfate to women with severe preeclampsia and eclampsia reduces intracerebral arteral spasm when measured by Doppler examination of the internal carotid and the middle cerebral arteries[1]. In addition, there are also several mechanisms by which magne-sium may prevent disease progression in women with preeclampsia. Although the exact etiology of preeclampsia remains elusive, several theories have been proposed[17]. First, thrombotic lesions of the placenta are more common in women with preeclampsia and may play a role in the pathogenesis of the disease. Plasminogen activator inhibitor type 2 prevents clot degradation by plasminogen. In placental tissue, magnesium cleaves plasminogen activator type 2 and therefore may reduce placental thrombosis. Second, preeclampsia is a disease of endothelial cell dysfunction. Magnesium has an in vitro protective effect on some endothelial cells. Last, preeclampsia is associated with an increase in inflammatory response demonstrated by leukocyte activation. Magnesium may have some anti-inflammatory properties, because it reduces leukocyte activation.

Administration and doses of magnesium sulfate [1,9,11]

The two most widely used regimens of magnesium sulfate administration are the intravenous regimen and the intramuscular regimen. In the intravenous regimen, a continuous loading dose of 4 g (usually in 20% solution) (5 g is used in this center) is given over 5 minutes which is followed by an intravenous infusion of 1 g/hour continued for 24 hours after the last seizure. In the intramuscular regimen, a continuous intravenous loading dose of 4 g is given over 5 minutes followed immediately by 5 g (usually in 50% solution) as a deep intramuscular injection into the upper outer quadrant of each buttock. Maintenance therapy is in the form of a further 5 g intramuscularly every 4 hours, to be continued for 24 hours after the last fit. If convulsions recur, both regimens advocate a further 2-4 g (depending on the woman's weight, 2 g if < 70 kg) to be given intravenously over 5 minutes. Controversy exists regarding the optimum maintenance dose in the intravenous regimen. An infusion of 1 g/hour was used in the collaborative trial[9] and in this institution, but some authors have advocated 2 g/hour and even suggested that 3 g/hour might be needed for the first 3 hours of treatment in some cases. In the author's opinion, the maintenance dose in the intravenous regimen should depend on plasma volume, urine output, signs and symptoms of the patient which will vary case by case. For example, if the patient develops severe headache, visual disturbance, or epigastric pain despite a maintenance infusion of 1 g/h; the infusion dose should be increased.

Effects of magnesium sulfate on maternal mortality and morbidities

Maternal mortality

In the Magpie Trial[9], maternal mortality was lower among women allocated magnesium sulfate than those allocated placebo (RR 0.55, 95% CI 0.26 to 1.14). Duley et al[11] performed a meta-analysis to assess the effects of anticonvulsants for preeclampsia on the women and their children. They found that only 2 trials (10,795 women) reported maternal deaths. The risk of dying was reduced by 46% for women allocated magnesium sulfate rather than placebo or no anticonvulsant, although this did not achieve statistical significance (RR 0.54, 95% CI 0.26 to 1.10)[11]. This effect was consistent regardless of severity of pre-eclampsia, whether antepartum at trial entry, gestation at trial entry or whether an anticonvulsant had been given before trial entry[11].

Maternal morbidities

From the meta-analytic study of Duley et al[11], there were 2 trials (10,332 women) reporting serious maternal morbidity; the relative risk was 1.08 (95% CI 0.89 to 1.32). This lack of evidence for any overall effect was consistent across the subgroups. For the individual measures of serious morbidity, such as pneumonia, renal failure and liver failure, there was also no clear evidence of an overall difference in effect between the magnesium sulfate and the placebo or no anticonvulsant groups[11]. There was a small (3%) reduction in the need for antihypertensive therapy associated with the use of magnesium sulfate rather than placebo or no anticonvulsant (RR 0.97, 95% CI 0.95 to 0.99)[11].

Side effects and toxicity of magnesium sulfate

The reductance to use magnesium sulfate in the past arose partly because of concerns about respiratory depression in the mother. The Magpie Trial[9] has further dispelled these concerns. From the Magpie Trial, magnesium sulfate does not appear to have substantive harmful effects to the mother. Importantly, safe monitoring was achieved without serum magnesium measurement, using simple clinical assessment of tendon reflexes, respiratory rate, and urine output. From the meta-analytic study of Duley et al[11], toxicity (absent or reduced tendon reflexes and/or respiratory depression) was uncommon, occurring in around 1% of women given magnesium sulfate. There was no clear evidence of an overall difference in the risk of absent or reduced tendon reflexes (RR 1.00, 95% CI 0.70 to 1.42)[11]. However, the risk of respiratory depression, or other respiratory problems, was increased for women allocated magnesium sulfate (RR 1.98, 95% CI 1.24 to 3.15)[11].

The most common side effect of magnesium sulfate administration is flushing (20%)[1,11,15]. Other reported uncommon side effects are nausea and/or vomiting, slurred speech, muscle weakness, hypotension (low blood pressure), dizziness, drowsiness or confusion, and headache[1,11,15]. However, almost all the data on side effects and safety come from studies that used either the intramuscular regimen for maintenance therapy, or the intravenous route with 1 g/hour, and for around 24 hours[9,11]. The use of higher doses and longer duration cannot be supported by these data. In particular, the reassurance about safety and lack of serious side effects cannot be extrapolated to higher doses or longer duration of therapy. In the Magpie Trial[9], even though the route for maintenance therapy was not allocated at random, the intravenous route does appear to be associated with fewer side effects than in the intramuscular route.

Effects of magnesium sulfate on complications of pregnancy, labor and delivery

Duley et al[11] found that the risk of placental abruption was reduced for preeclamptic women treated by magnesium sulfate rather than placebo (RR 0.64, 95% CI 0.50 to 0.83). However, for women allocated magnesium sulfate the risk of cesarean section was a little higher (5% increase) than for those allocated placebo or no anticonvulsant (RR 1.05, 95% CI 1.01 to 1.10)[11]. There was no clear evidence of an effect of magnesium sulfate on the risk of postpartum hemorrhage (RR 0.96, 95% CI 0.88 to 1.05) or on manual removal of placenta (RR 0.90, 95% CI 0.72 to 1.12)[11]. In addition several studies have noted that magnesium sulfate does not increase the duration of labor[1,11,16].

Effects of magnesium sulfate on fetal heart rate

The effect of magnesium sulfate on fetal heart rate (FHR) tracings has been a controversial issue. Although many studies have addressed the issue, their findings have been contradictory because of the observation nature of most prior investigations or the use of patients as their own controls. Hallak et al[18] performed a randomized, placebo-controlled trial of the effect of magnesium sulfate on fetal heart rate parameters. They concluded that prolonged administration of magnesium sulfate was associated with decreased FHR baseline values and variability

in the third hour after administration. Given the small magnitude of these changes, the clinical significance of these findings is questionable. Magnesium sulfate inhibition of the increasing number of accelerations with gestational age needs to be considered when fetal well-being is assessed.

Effects of magnesium sulfate on perinatal deaths and neonatal morbidities

Perinatal deaths

From the meta-analytic study of Duley et al[11], there was no overall difference in the risk of stillbirth or neonatal death (3 trials, 9,961 women), although a small increase or decrease in perinatal mortality associated with the use of magnesium sulfate remains possible (RR 1.04, 95%CI 0.93 to 1.15). The result was consistent regardless of gestation at trial entry. For the composite outcome of death or in the special care baby unit there was no clear evidence of a clinically important difference (RR 1.01, 95%CI 0.95 to 1.08)[11]. Therefore, the use of magnesium sulfate in severe preeclampsia does not affect the rate of perinatal deaths.

Neonatal morbidities

Duley et al[11] reported that there was no clear evidence of a difference in neonatal morbidity between the magnesium sulfate and the placebo groups, for example admission to the special care baby unit (RR 1.01, 95% CI 0.96 to 1.06), admission to the special care baby unit for more than seven days (RR 1.02, 95% CI 0.93 to 1.11), or intubation at the place of delivery (RR 1.01, 95% CI 0.82 to 1.24). Therefore, the use of magnesium sulfate in severe preeclampsia does not affect the rates of Apgar score < 7 at 5 minutes, respiratory distress, need for intubation, hypotonia, or days in the special care baby unit.

There are several randomized studies describing the perinatal-neonatal effects of maternal magnesium sulfate when used as a tocolytic agent. In a systemic review of these studies, Crowther et al[19] reported that magnesium sulfate use was associated with increased rates of fetal, neonatal, and infant mortalities. This increased risk was limited to women receiving relatively high maintenance doses of magnesium sulfate (≥ 2 g/hour). However, the results of a recent large randomized trial comparing the perinatal effects in women assigned either to magnesium sulfate (n = 535) or a placebo (n = 527) revealed no adverse effects on either the fetus or the infant[20]

Conclusion

Magnesium sulfate is now the gold standard anticonvulsant for women with eclampsia. The use of magnesium sulfate in the management of women with severe preeclampsia can reduce the development of eclampsia. However, in women with mild preeclampsia the routine use of magnesium sulfate for seizure prophylaxis is not recommended at present. Side effects and toxicity of magnesium sulfate when used with careful monitoring are minimal.

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แมกนีเซียมซัลเฟตใช้เพื่อป้องกันหรือรักษาภาวะพิษแห่งครรภ์

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การฉีดแมกนีเซียมซัลเฟตเข้าหลอดเลือดดำมีประสิทธิภาพในการลดอุบัติการณ์ของการเกิดภาวะพิษแห่งครรภ์ ร่วมกับการชัก (eclampsia) ในสตรีตั้งครรภ์ที่เป็นพิษแห่งครรภ์ระดับรุนแรง (severe preeclampsia) อย่างไรก็ตาม ไม่เป็นการเหมาะสมที่จะใช้แมกนีเซียมซัลเฟตในสตรีตั้งครรภ์ที่เกิดพิษแห่งครรภ์ทุกราย เนื่องจากอุบัติการณ์ของการเกิดภาวะพิษแห่งครรภ์ร่วมกับการชัก ในสตรีตั้งครรภ์ที่เป็นพิษแห่งครรภ์ระดับเริ่มต้น (mild preeclampsia) จะน้อยกว่าในสตรีตั้งครรภ์ที่เป็นภาวะพิษแห่งครรภ์ระดับรุนแรง และอาจพบอาการข้างเคียงที่ไม่พึงประสงค์ของแมกนีเซียมซัลเฟตได้ ควรพิจารณาให้แมกนีเซียมซัลเฟตในสตรีตั้งครรภ์ที่พบภาวะพิษแห่งครรภ์ และมีโอกาสเสี่ยงต่อการชัก เช่น รีเฟล็กซ์ไว ปวดศีรษะบริเวณหน้าผาก ตามัว จุกแน่นลิ้นปี่ เนื่องจากแมกนีเซียมซัลเฟตราคาไม่แพง จึงเหมาะที่จะนำมาใช้ในประเทศที่กำลังพัฒนา มักนิยมฉีดแมกนีเซียมซัลเฟตเข้าหลอดเลือดดำ เนื่องจากมีอาการข้างเคียงโดยเฉพาะบริเวณที่ฉีดยาน้อยกว่าการฉีดเข้ากล้าม ระยะเวลาของการให้ยาแมกนีเซียมซัลเฟตไม่ควรเกิน 24 ชั่วโมง และถ้าใช้ฉีดเข้าหลอดเลือดดำเพื่อป้องกันการชัก ขนาดของยาที่ใช้ไม่ควรเกิน 1 กรัมต่อชั่วโมง การตรวจหาระดับแมกนีเซียมในเลือดไม่มีความจำเป็น การตรวจติดตามความเป็นพิษ (toxicity) ของแมกนีเซียมให้ใช้การเฝ้าระวังทางคลินิก เช่น อัตราการหายใจ รีเฟล็กซ์ข้อเข่า และปริมาณปัสสาวะ ซึ่งสามารถทำได้โดยแพทย์ ผดุงครรภ์ และพยาบาลที่ผ่านการฝึกฝน อย่างไรก็ตามการใช้ยาแมกนีเซียมซัลเฟตไม่ได้ทดแทนการเฝ้าระวังสตรีตั้งครรภ์ที่เกิดภาวะพิษแห่งครรภ์อย่างใกล้ชิด เนื่องจากการดำเนินโรคจากภาวะพิษแห่งครรภ์ระดับเริ่มต้นเป็นระดับรุนแรง และเกิดภาวะแทรกซ้อนในมารดาขั้นรุนแรง ไม่สามารถทำนายได้อย่างแม่นยำทั้งในระยะก่อนคลอด ระยะเจ็บครรภ์คลอด และระยะหลังคลอด ดังนั้นการตรวจติดตามและการเฝ้าระวังอย่างต่อเนื่องในทุกระยะของการตั้งครรภ์มีความสำคัญเพื่อให้เกิดผลลัพธ์ที่ดีทั้งต่อมารดาและทารก