MAGNESIUM SULFAT

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Strategies to consider including in country plans

- Tertiary prevention:
  - Treatment of severe preeclampsia (prevent eclampsia
  - Treatment of Eclampsia
- Secondary Prevention: detecting Preeclampsia and timely delivery
- Primary Prevention

- Seeking simple, inexpensive and effective solutions that reach all pregnant women

Managing Preeclampsia

- **Monitoring for effects of PE on**
  - Renal and other functions
  - Fetal growth and well being
- Detecting severe Preeclampsia
- **Controlling high blood pressure**
- **Preventing Seizures** : Deciding when to institute Magnesium Sulphate therapy
  - On confirming diagnosis of Severe Preeclampsia
  - In the context of severe Preeclampsia once decision to deliver has been made
- **Timely Delivery / Care of term and preterm infants**
- **Postpartum vigilance and care**

Seizure Prophylaxis

- difficult to predict who will seize
  - not directly related to degree of hypertension or level of proteinuria
- high 'number needed to treat' to prevent seizure
- agents not innocuous nor completely effective
- $MgSO_4$ is agent of choice when seizure prophylaxis is felt to be indicated

Magnesium Sulfate

- obstetrical standard but not used in other settings
- superior to phenytoin for prophylaxis
- superior to phenytoin or diazepam in preventing recurrence

- Dosage - 4 g IV followed by 1 - 4 g / hour IV or 4 g IM q4h
- Side Effects - weakness, paralysis, cardiac toxicity
- Monitor - reflexes, respiration, level of consciousness

Treating Eclampsia

Comparison between magnesium sulphate and diazepam: 5 trials 1236 women: comparison between magnesium sulphate and diazepam

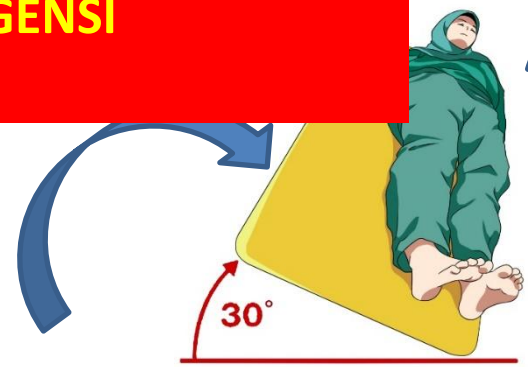
- More than 50% reduction in recurrence of convulsions RR 0.45 95% CI 0.35-0.58
  - For every 7 women treated with mgSo4 rather than diazepam, I case of recurrent convulsions prevented
- Reduction in maternal mortality RR 0.60 (0.36-1.00)
- Reduction in low apgar at 5 minutes RR 0.72 (95% CI 0.55-0.94)

Cochrane reviews

EKLAMPSIA

illustrated by : Andina Rialdi

MANAJEMEN EMERGENSI EKLAMPSIA



ABCCCD

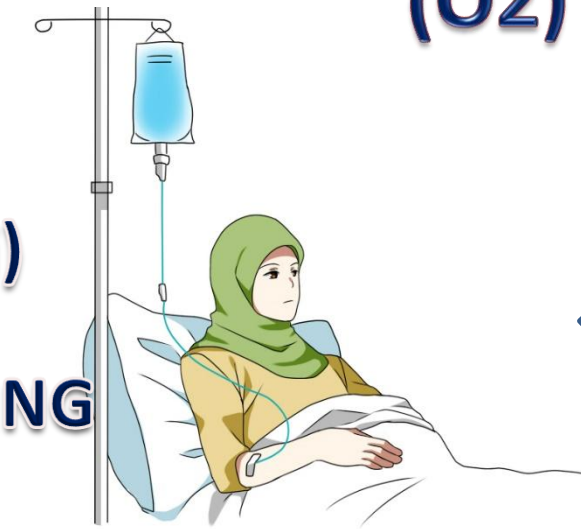
BREATHING (O2)

CIRCULATION

CONTROL KEJANG (MgSO4, antihipertensi)

CONTINUOUS MONITORING

DELIVER THE BABY



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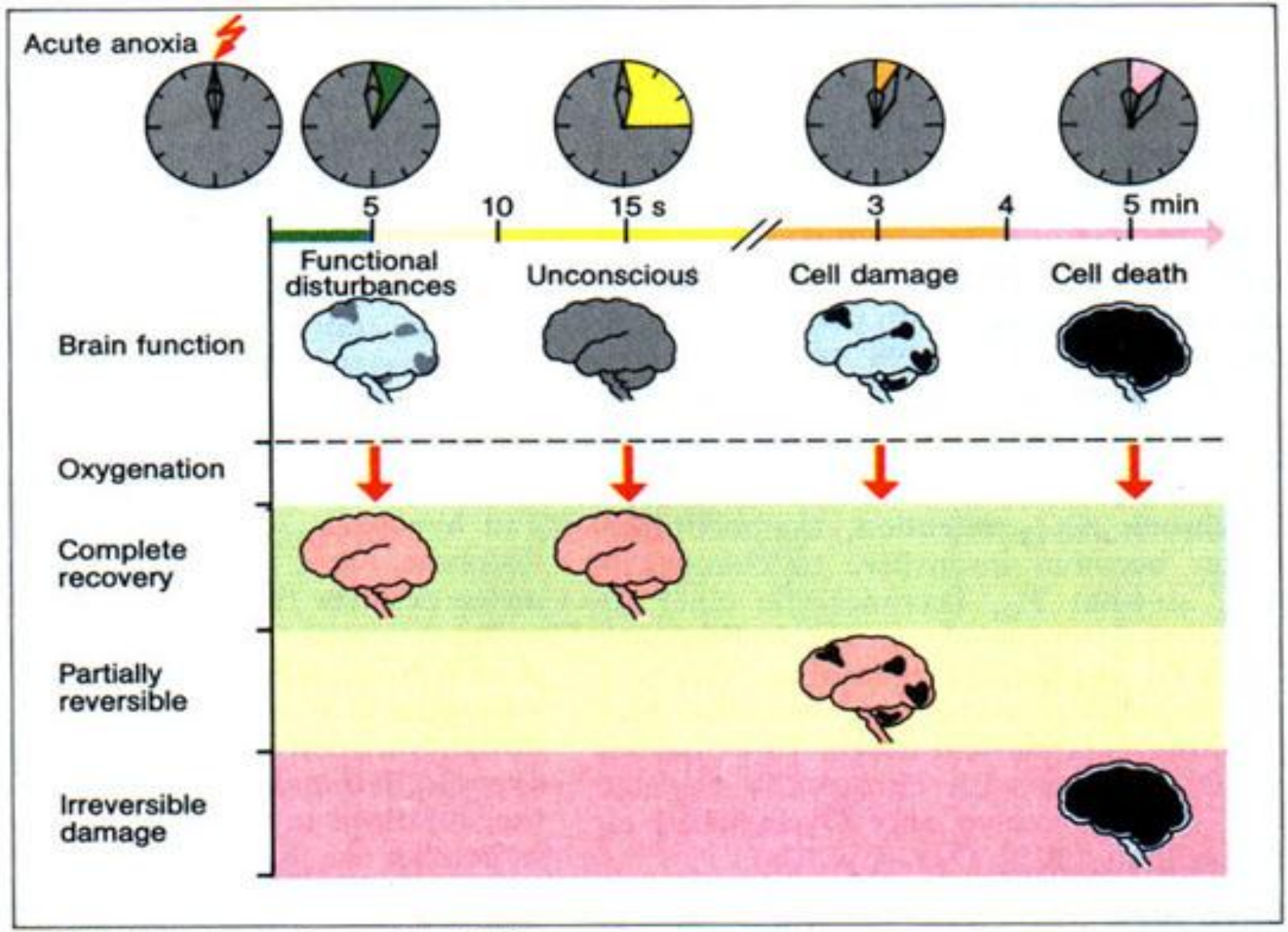
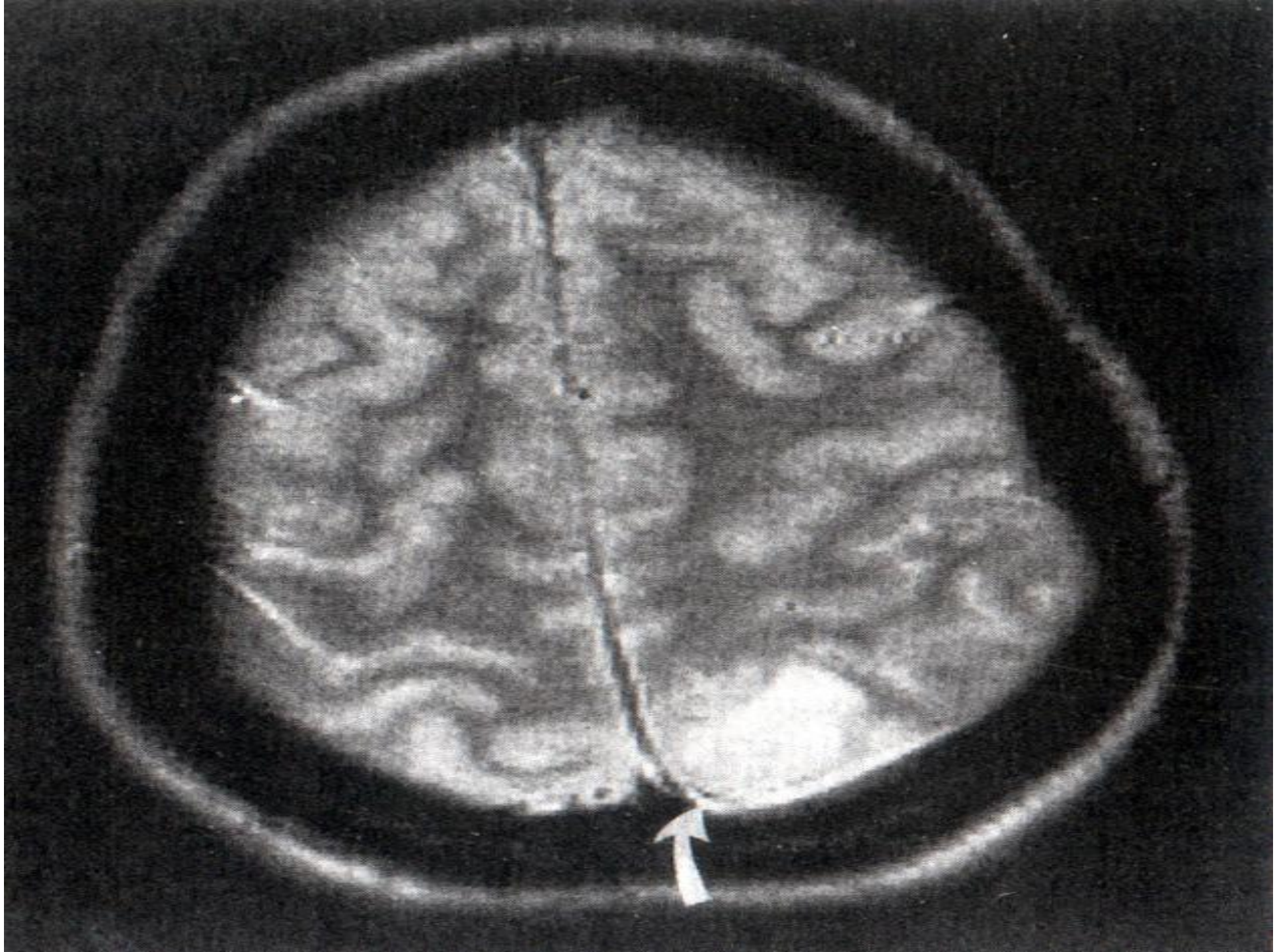
PENATALAKSANAAN EMERGENSI EKLAMPSIA DAN PREEKLAMPSIA

- AIRWAY (SEMBARI MIRINGKAN IBU 15-30°)
- BREATHING => Pasang O2
- CIRCULATION : ukur tekanan darah, infus
- Control
  - Kejang (MGSO4)
  - Tekanan darah (antihipertensi)
- Continuous Monitoring: Balans Cairan, pasang kateter, pemeriksaan penunjang.
- Deliver: LAHIRKAN BAYI
- CEGAH KEJANG BERULANG DAN KOMPLIKASINYA

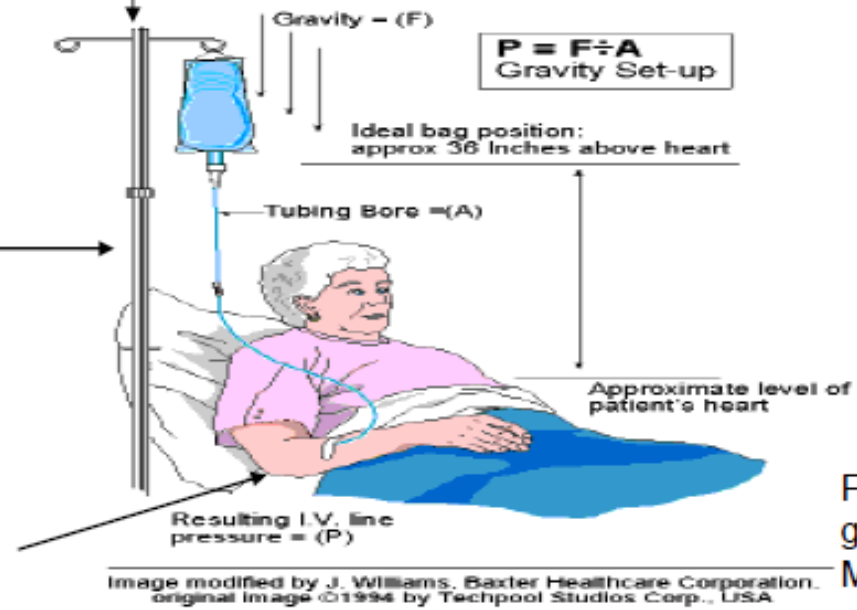


B. Effects of anoxia on the CNS



Treatment with MgSO4

I MgSO4 40% 15 cc (6 gram) in RL



Drips
15 – 20/menit

Intra Venous
MgSO4 40%
4 gram (10 cc)
in 10 menit

Fit happen
give 2 gram (5 cc)
MgSO4 40%

Dosis dan cara pemberian MgSO4

- **Loading dose :** 4 g MgSO4 40% dalam 100 cc NaCL : habis dalam 30 menit (73 tts / menit)
- **Maintenance dose** : 6 gr MgSO4 40% dalam 500 cc Ringer Laktat selama 6 jam : (28 tts/menit)
- **Awasi** : volume urine, frekuensi nafas, dan reflex patella setiap jam
- Pastikan tidak ada **tanda-tanda intoksikasi magnesium** pada setiap pemberian MgSO4 ulangan
- Bila ada kejang ulangan : berikan 2g MgSO4 40%, IV

A. ALTERNATIF 1 (Pemberian kombinasi iv dan im) (untuk Faskes primer, sekunder dan tersier)

Loading dose

- **Injeksi 4g iv bolus ($MgSO_4$ 20%) 20cc** selama 5 menit (jika tersedia **$MgSO_4$ 40%, berikan 10cc diencerkan dengan 10 cc aquabidest**)
- **Injeksi 10g im ($MgSO_4$ 40%) 25cc** pelan, masing – masing pada bokong kanan dan kiri berikan 5g (12,5cc). Dapat ditambahkan 1mL Lidokain 2% untuk mengurangi nyeri

Maintenance Dose

Injeksi 5g im ($MgSO_4$ 40%) 12,5cc pelan, pada bokong bergantian setiap 6 jam

B. ALTERNATIF 2 (Pemberian iv saja) (hanya untuk Faskes sekunder dan tersier)

Initial Dose

- **Injeksi 4g iv bolus ($MgSO_4$ 20%) 20cc** selama 5 menit (jika tersedia **$MgSO_4$ 40%, berikan 10cc diencerkan dengan 10 cc aquabidest**)

Dilanjutkan *Syringe pump atau infusion pump*

- Lanjutkan dengan pemberian **$MgSO_4$ 1g/jam**, contoh: sisa **15cc atau 6g ($MgSO_4$ 40%) diencerkan dengan 15cc aquabidest dan berikan selama 6 jam**

Atau dilanjutkan *Infusion Drip* *

- Lanjutkan dengan pemberian **$MgSO_4$ 1g/jam**, contoh: sisa **15cc atau 6g ($MgSO_4$ 40%) diencerkan dengan 500cc kristaloid dan berikan selama 6 jam (28 tetes / menit)**

C. Jika didapatkan kejang ulangan setelah pemberian $MgSO_4$

Tambahan **2g iv bolus ($MgSO_4$ 20%) 10cc** (jika tersedia **$MgSO_4$ 40%, berikan 5cc diencerkan dengan 5cc aquabidest**). Berikan selama 2 – 5 menit, dapat diulang 2 kali. Jika masih kejang kembali beri diazepam

Cara Kerja MgSO4 pada Preeclampsia

Dilatasi dari pembuluh darah otak

meningkatkan aliran darah plasenta

terpenuhinya nutrisi janin dan perkembangan janin.

↓iskemi plasenta

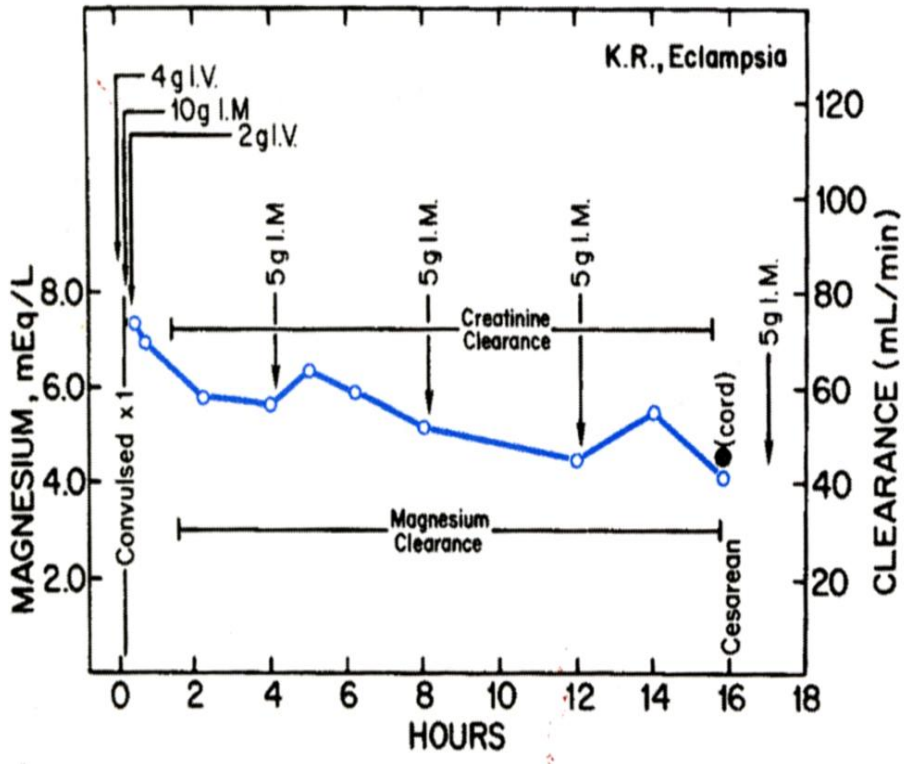
↓produksi faktor antiangiogenik

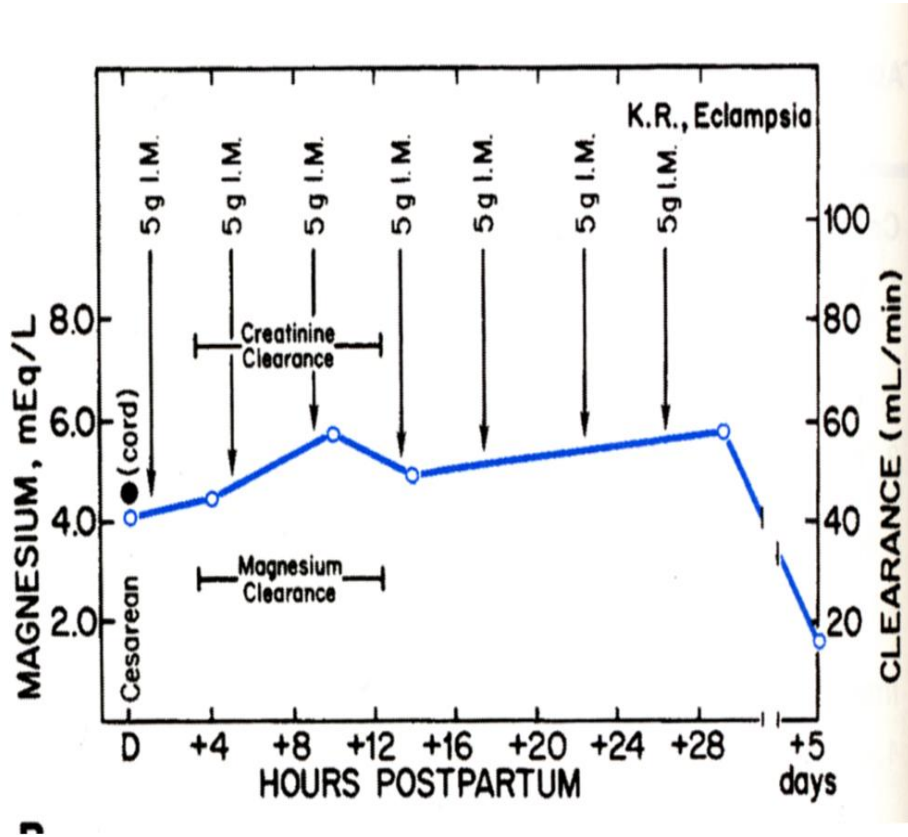
Memperbaiki biovailabilitas faktor angiogenik(PIGF dan VEGF)

MgSO4

Meningkatkan fleksibilitas arteri sentral

Terapi MgSO4





MgSO4 harus diberikan sejak pasien masuk sampai 24 jam postpartum agar kadar terapi terjamin

Recommendations for women who should be treated with magnesium

	Preeclampsia without severe features	Severe Preeclampsia	Eclampsia
ACOG	**	X	X
NICE		X	X
SOGC	X*	X	X
CMQCC	X*	X	X
WHO	X	X	X

***ACOG Executive Summary, 2013: for preeclampsia without severe features, it is suggested that magnesium sulfate not be administered universally for the prevention of eclampsia.*

** Should be considered: Numbers needed to treat (**NNT**) = 109 for "mild", 63 for "severe"*

Recommendations

116. Magnesium sulphate is recommended for first-line treatment of eclampsia. (I-A)
117. Magnesium sulphate is recommended as prophylaxis against eclampsia in women with severe preeclampsia. (I-A)
118. Magnesium sulphate may be considered as prophylaxis against eclampsia in women with non-severe preeclampsia but with severe hypertension, headaches/visual symptoms, right upper quadrant/epigastric pain, platelet count $< 100\,000 \times 10^9$/L, progressive renal insufficiency, and/or elevated liver enzymes, based on cost considerations. (I-C)
119. Magnesium sulphate should be used in standard dosing, usually 4 g intravenous loading dose followed by 1 g/hour. (I-A)
120. Routine monitoring of serum magnesium levels is not recommended. (I-E)
121. Phenytoin and benzodiazepines should not be used for eclampsia prophylaxis or treatment, unless there is a contraindication to magnesium sulphate or it is ineffective. (I-E)

Key clinical pearl

- Magnesium sulfate therapy for seizure prophylaxis should be administered to any patients with:
  - Preeclampsia ***with*** "severe features" i.e., subjective neurological symptoms (headache or blurry vision), abdominal pain, epigastric pain AND
  - ***should be considered*** in patients with preeclampsia ***without*** severe features)

Magnesium Sulfate - Overdose

- close observation for side effects
  - weakness, respiratory paralysis, somnolence
- especially high risk in those with oliguria or receiving Ca^{2+} channel blockers

ANTIDOTE

- stop magnesium infusion
- 10% Calcium gluconate 10 mL IV over 3 minutes

Transport

- consider transport only if resources limited and maternal/fetal condition permits
- maternal BP and symptoms stable
- fetal status reassuring
- appropriate anti-hypertensive agents started
- $MgSO_4$ started if appropriate
- discuss with accepting centre and patient/family
-

PROSES RUJUKAN

Stabilisasi pra rujukan

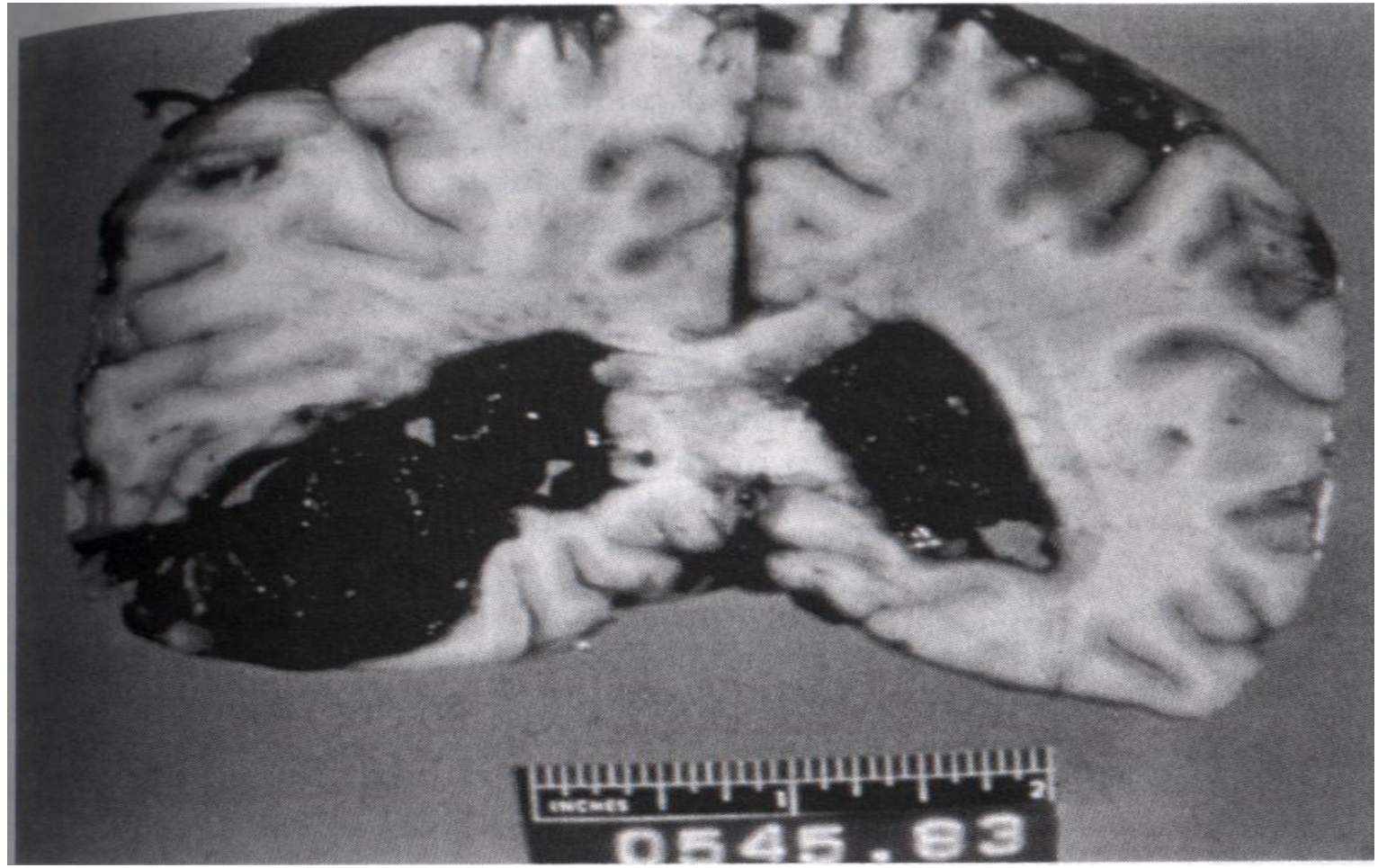
- Stabilisasi umum (Oksigenasi/ pernafasan, Hemo dinamik, Kesadaran)
- Stabilisasi khusus **(Pemberian MgSO4)**,
- Perlu ketersediaan (Darah, Obat dan Bahan habis pakai/ BHP).

Transportasi yang cepat dan tepat

- Ambulans (Desa, Puskesmas, Rumah Sakit),
- Perlu koordinasi sebelum kedaruratan terjadi,
- Perlu peran serta aktif dari masyarakat.

Pendampingan

- Pengawasan oksigenasi, cairan infusi & pemberian obat-obatan,
- Keluarga dapat dididik untuk membantu pengawasan sederhana.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