

**PERBEDAAN KADAR MAGNESIUM DAN KADAR KALSIUM PADA KASUS  
PREEKLAMPSI BERAT DAN EKLAMPSI**

**TESIS**



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2022**

## ABSTRACT

### DIFFERENCES LEVELS OF CALCIUM MAGNESIUM IN CASES SEVERE PREECLAMPSIA AND ECLAMPSIA

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**Background :** The ratio of calcium and magnesium is important in the excitability of nerve cell signal transmission. And a small decrease in extracellular calcium or magnesium will cause increased excitability and burst firing, which alter the physiological and pathophysiological processes such as improving the long-term potentiation, pain transmission, epileptogenesis, and nerve damage. Both are mutually antagonistic ions are important in cellular metabolism and neuronal metabolism and maintain the stability of cell membranes. Pathophysiology seizures occur because of an increase in body chemistry, thus the oxidation reactions occur more rapidly and consequently oksigen will run out faster so there hypoxia.

**Method:** We performed an observasional comparative with cross sectional study on 16 women with severe preeclampsia and 16 women with eclampsia who met the inclusion criteria and there were no exclusion criteria. The samples were recruited in Dr. M Djamil general hospital Padang, Achmad Muchtar Hospital, and Pariaman District Hospital from April 2022 to Mei 2022. The levels of calcium serum were examined by atomic absorption spectrophotometry (AAS), magnesium levels were examined by enzymatic metode, sodium and potassium levels were examined by ion selection electrode (ISE). The differences in mean levels of calcium magnesium ratio and sodium potassium ratio between the two groups was analyzed by using T independent test.

**Result:** The mean levels of calcium magnesium ratio in severe preeclampsia was higher than eclampsia ( $4,3 + 0,92$  vs  $2,93 + 0,47$ ,  $p = 0,000$ ).

**Conclusion:** The mean levels of calcium magnesium ratio in severe preeclampsia was significantly higher than eclampsia.

**Keywords:** Calcium magnesium ratio, severe preeclampsia, eclampsia.

## ABSTRAK

### PERBEDAAN KADAR KALSIMUM DAN MAGNESIUM PADA KASUS PEB DAN EKLAMISIA

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**Latar Belakang** : Rasio kalsium magnesium penting dalam eksitabilitas dan transmisi sinyal sel saraf. Penurunan kecil kalsium ekstraseluler dan atau magnesium akan menyebabkan peningkatan rangsangan dan letupan pembakaran, yang mengubah proses fisiologis dan patofisiologis seperti meningkatkan potensiasi jangka panjang, transmisi nyeri, epileptogenesis, dan kerusakan saraf. Kedua ion yang saling bersifat antagonis ini penting dalam metabolisme seluler dan metabolisme neuronal serta menjaga stabilitas membran sel. Patofisiologi kejang terjadi karena peningkatan reaksi kimia tubuh, dengan demikian reaksi-reaksi oksidasi terjadi lebih cepat dan akibatnya oksigena akan lebih cepat habis sehingga terjadilah hipoksia.

**Metode** : Penelitian observasional komparatif dengan desain cross sectional pada 16 wanita dengan PEB, dan 16 wanita eklamsia yang memenuhi kriteria inklusi dan tidak terdapat kriteria eksklusi. Subjek penelitian dikumpulkan di RSUP Dr M Djamil Padang, RSUD Solok, dan RSUD Pariaman dari bulan April 2022 sampai Mei 2022. Kadar kalsium diperiksa dengan atomic absorption spectrophotometry (AAS), kadar magnesium diperiksa dengan metode enzymatic, kadar natrium dan kalium diperiksa dengan ion selection electrode (ISE). Perbedaan rerata rasio kalsium magnesium antara kedua kelompok dianalisis menggunakan uji T independent test.

**Hasil**: Rerata rasio kalsium magnesium pada PEB lebih tinggi daripada eklamsia ( $4,3 + 0,92$  vs  $2,93 + 0,47$ ,  $p = 0,000$ )

**Kesimpulan**: Rerata rasio kalsium magnesium pada PEB lebih tinggi secara bermakna

**Kata Kunci**: Rasio kalsium magnesium serum maternal, Preeklamsia Berat, Eklamsia.

