

INTISARI

LatarBelakang: Monosodium glutamat (MSG) merupakan substansi tambahan makanan yang banyak digunakan di seluruh dunia sebagai bumbu masak dan pembangkit cita rasa. Meskipun demikian, MSG dengan dosis tertentu bias menyebabkan kerusakan pada berbagai organ, termasuk cortex prefrontalis.

TujuanPenelitian: Penelitian ini bertujuan untuk mempelajari efek pemberian MSG dengan dosis yang berbeda-beda terhadap memori kerja dan jumlah sel pyramidal cortex prefrontalis pada tikus Wistar (*Rattus norvegicus*) jantan remaja.

MetodePenelitian: Dua puluh empat ekor tikus Wistar (*Rattus norvegicus*) jantan usia 4-5 minggu dibagi dalam 4 kelompok (C, T2,5, T3, dan T3,5). Tikus di kelompok C diinjeksi 2 ml NaCl 0,9% per intraperitoneal, sedangkan tikus di kelompok T2,5, T3, dan T3,5 diinjeksi MSG sebanyak 2,5 mg/g BB, 3 mg/gBB, dan 3,5 mg/gBB, selama 10 hari berturut-turut. Uji Y-maze dilakukan satu hari setelah perlakuan selesai, untuk menilai memori kerja. Jumlah sel pyramidal cortex prefrontalis dihitung dengan menggunakan metode fraksionator fisik.

Hasil: Memori kerja dan jumlah sel pyramidal cortex prefrontalis antara kelompok kontrol dengan kelompok yang terpapar MSG pada dosis yang diteliti tidak terdapat perbedaan yang bermakna. Terdapat hubungan yang bermakna dengan korelasi positif antara jumlah sel pyramidal cortex prefrontalis dengan memori kerja tikus Wistar (*Rattus norvegicus*) jantan remaja.

Kesimpulan: Monosodium glutamat (MSG) pada dosis yang diteliti belum memberikan efek neurotoksik. Hubungan antara memori kerja dengan jumlah sel pyramidal cortex prefrontalis tikus menunjukkan hubungan yang bermakna dengan korelasi positif.

Kata kunci: MSG, memori kerja, cortex prefrontalis

ABSTRACT

Background: Monosodium glutamate (MSG) is a food additive substance that is widely used as seasoning and flavor enhancer throughout the world. However, MSG at certain dosages is also thought to cause damage to many organs, including prefrontal cortex.

Objective: The aim of the present study is to examine the effects of a range of doses of MSG on the working memory and estimated total number of pyramidal neurons in the prefrontal cortex of rats.

Methods: A total of 24 male rats aged 4 to 5 weeks were divided into four groups (C, T2.5, T3, and T3.5 groups). Rats in C group received intraperitoneal injection of 0.9% sodium chloride solution. Rats in T2.5, T3, and T3.5 injected with 2.5 mg/g body weight (bw) of MSG, 3.0 mg/g bw of MSG, and 3.5 mg/g bw of MSG, respectively, for 10 consecutive days. The working memory of the rats was examined one day after the treatment. The number of prefrontal cortex pyramidal cells was estimated using physical fractionator method.

Results: Working memory and total number of pyramidal cells in the prefrontal cortex between control group and groups were exposed to MSG at the current doses showed no significant difference. There is a significant positive correlation between working memory and total number of pyramidal cells in the prefrontal cortex.

Conclusion: Monosodium glutamate (MSG) at this range of doses yet give neurotoxic effects. There was a significant correlation between working memory and the total number of pyramidal cells.

Keywords: MSG, working memory, prefrontal cortex