PERBEDAAN JUMLAH SEL PIRAMIDAL KORTEKS PREFRONTAL TIKUS PUTIH (*Rattus norvegicus*) JANTAN PASCA INDUKSI *PARADOXICAL SLEEP DEPRIVATION* DAN *TOTAL SLEEP DEPRIVATION*

ABSTRAK

Latar belakang : Stres yang disebabkan oleh perlakuan *paradoxical sleep deprivation* (PSD) dan *total sleep deprivation* (TSD) meningkatkan terjadinya strees oksidatif dan inflamasi yang dapat mengakibatkan kerusakan multi organ, termasuk otak. Individu dengan *sleep deprivation* dilaporkan mengalami gangguan yang signifikan dalam fungsi kognisi dan kontrol perilaku yang diperankan oleh korteks prefrontal serebrum. Belum ada penelitian yang mengkonfirmasi bahwa PSD dan TSD dapat menyebabkan penurunan jumlah sel piramidal sebagai neuron proyeksi utama pada korteks prefrontal.

Tujuan : Mengetahui perbedaan jumlah sel piramidal korteks prefrontal tikus putih (*Rattus norvegicus*) jantan pasca induksi *paradoxical sleep deprivation* (PSD) dan *total sleep deprivation* (TSD).

Metode : Desain penelitian eksperimental yang digunakan adalah *post test only with control group*. Tiga puluh ekor tikus putih dibagi secara acak menjadi 3 kelompok yaitu KI (kontrol sehat), KII (PSD 20 jam/hari selama 8 hari), KIII (TSD 24 jam/hari selama 8 hari).

Hasil : Rerata jumlah sel piramidal korteks prefrontal tertinggi terdapat pada KI (77,10±26,113), diikuti KII (66,67±24,556) dan terendah KIII (65,90±34,911). Uji *One Way* ANOVA didapatkan p>0,05, yaitu p=0,638.

Kesimpulan : Tidak terdapat perbedaan yang signifikan rerata jumlah sel piramidal korteks prefrontal tikus putih (*Rattus norvegicus*) jantan pasca induksi *paradoxical sleep deprivation* (PSD) dan *total sleep deprivation* (TSD).

Kata Kunci : *Paradoxical sleep deprivation* (PSD), *Total sleep deprivation* (TSD), Jumlah sel piramidal, Korteks prefrontal.

THE DIFFERENCE OF PREFRONTAL CORTEX PYRAMIDAL CELLS NUMBER IN MALE ALBINO RATS (*Rattus norvegicus*) AFTER PARADOXICAL SLEEP DEPRIVATION AND TOTAL SLEEP DEPRIVATION INDUCTION

ABSTRACT

Background: Stress caused by paradoxical sleep deprivation (PSD) and total sleep deprivation (TSD) increased oxidative stress and inflamation which can cause multiple organ damage, including the brain. Individu with sleep deprivation reported to experience significant impairments in cognitive function and behavioral control played by the cerebrum prefrontal cortex. There are no studies yet that confirm PSD and TSD can cause decreased in pyramid cells count as the main projection neurons in prefrontal cortex.

Objective: To know the difference of prefrontal cortex pyramidal cell number in male albino rats (*Rattus norvegicus*) after paradoxical sleep deprivation (PSD) and total sleep deprivation (TSD) induction.

Method: The design used in this experimental research was post test only with control group. Thirty male albino rats were distributed into 3 groups, KI (health control), KII (PSD 20 hours/day for 8 days), KIII (TSD 24 hours/day for 8 days)

Result: The highest prefrontal cortex pyramidal cell counts were found in KI (77.10 ± 26.113), followed by KII (66.67 ± 24.556) and the lowest KIII (65.90 ± 34.911). Result for One Way ANOVA test obtained $p > 0.05$, which is $p = 0.638$.

Conclusion: There was no significant difference in the mean of prefrontal cortex pyramidal cells number in male albino rats (*Rattus norvegicus*) after paradoxical sleep deprivation (PSD) and total sleep deprivation (TSD) induction.

Key Word : Paradoxical sleep deprivation (PSD), Total sleep deprivation (TSD), Pyramidal Cells number, Prefrontal Cortex.