

**PERBEDAAN VIABILITAS SPERMATOZOA TIKUS PUTIH
(*Rattus norvegicus*) JANTAN PASCA INDUKSI BERBAGAI
MODEL STRES *SLEEP DEPRIVATION***

ABSTRAK

Latar Belakang : Stres yang disebabkan *sleep deprivation* dapat mempengaruhi regulasi hormon GnRH, LH, testosteron dan peningkatan level glukokortikoid yang menyebabkan penurunan viabilitas spermatozoa. *Sleep recovery* dapat memperbaiki interaksi aksis *hypothalamic pituitary adrenal* (HPA), penurunan peroksidase lipid dan radikal bebas, serta peningkatan kadar antioksidan *Glutathione* yang dapat memperbaiki dampak stres akibat *sleep deprivation*.

Tujuan : Mengetahui perbedaan viabilitas spermatozoa pada tikus putih (*Rattus norvegicus*) jantan pasca induksi berbagai model stres *sleep deprivation*.

Metode : Penelitian ini merupakan penelitian eksperimental dengan desain *posttest only with control group*. Tiga puluh ekor tikus putih dibagi secara acak menjadi 5 kelompok yaitu K I (kontrol sehat), K II (PSD selama 20 jam/hari selama 5 hari), K III (TSD 24 jam/hari selama 5 hari), K IV (PSD 20 jam/hari selama 5 hari pertama dan dilanjutkan dengan *sleep recovery* selama 5 hari berikutnya), dan K V (TSD 24 jam/hari selama 5 hari pertama dan dilanjutkan dengan *sleep recovery* selama 5 hari berikutnya).

Hasil : Rerata viabilitas spermatozoa tertinggi terdapat pada K I ($75,80 \pm 4,56$), diikuti K IV ($67,60 \pm 2,65$), K II ($66,90 \pm 4,08$), K V ($33,70 \pm 7,04$), dan K III ($31,00 \pm 7,39$). Uji *One Way ANOVA* menunjukkan terdapat perbedaan rerata yang signifikan ($p < 0,05$) kemudian uji *Post-Hoc Tukey* menunjukkan adanya perbedaan rerata yang signifikan ($p < 0,05$) pada kelompok I-III, I-V, II-III, II-V, III-IV dan IV-V.

Kesimpulan : Terdapat perbedaan signifikan antara rerata viabilitas spermatozoa tikus putih (*Rattus norvegicus*) jantan pasca induksi berbagai model stres *sleep deprivation*.

Kata Kunci : *Paradoxical Sleep Deprivation* (PSD), *Sleep Recovery* (SR), *Total Sleep Deprivation* (TSD), Viabilitas Spermatozoa

THE DIFFERENCE OF SPERMATOZOA VIABILITY IN MALE ALBINO RATS (*Rattus norvegicus*) AFTER INDUCTION OF VARIOUS MODELS OF SLEEP DEPRIVATION STRESS

ABSTRACT

Background : Stress caused by sleep deprivation can affect the regulation of the GnRH, LH, testosterone and increase in glucocorticoid levels which causes a decrease in spermatozoa viability. Sleep recovery can improve the interaction of the hypothalamic pituitary adrenal (HPA) axis, decrease in lipid peroxidation and free radicals, and increase Glutathione antioxidant levels which can improve the impact of stress due to sleep deprivation.

Objective : To know the difference of spermatozoa viability in male albino rats (*Rattus norvegicus*) after induction of various models of sleep deprivation stress.

Method : This research was an experimental research with posttest only with control group design. Thirty male albino rats were distributed into 5 groups, K I (health control), K II (PSD 20 hours/day sleep deprivation for 5 days), K III (TSD 24 hours/day sleep deprivation for 5 days), K IV (PSD 20 hours/day sleep deprivation for 5 days continued with sleep recovery for the next 5 days), K V (TSD 24 hours/day sleep deprivation for 5 days continued with sleep recovery for the next 5 days).

Result : The highest mean of spermatozoa viability was in K I ($75,80 \pm 4,56$), followed by K IV ($67,60 \pm 2,65$), K II ($66,90 \pm 4,08$), K V ($33,70 \pm 7,04$), and K III ($31,00 \pm 7,39$). One way ANOVA showed significant differences ($p < 0,05$) and Post-Hoc Tukey showed significant differences ($p < 0,05$) in group I-III, I-V, II-III, II-V, III-IV and IV-V.

Conclusion : There was significant difference of spermatozoa viability male albino rats (*Rattus norvegicus*) after induction of various models of sleep deprivation stress.

Keywords : Paradoxical Sleep Deprivation (PSD), Sleep Recovery (SR), Spermatozoa viability, Total Sleep Deprivation (TSD)