

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

ABSTRAK

Latar Belakang : Stres akibat *paradoxical sleep deprivation* (PSD) dan *total sleep deprivation* (TSD) dapat menyebabkan peningkatan stres oksidatif, mengaktivasi HPA, gangguan pada HPG yang berhubungan dengan infertilitas. *Sleep recovery* (SR) dapat menurunkan produksi radikal bebas dengan mekanisme pemulihan kadar antioksidan sehingga dapat memperbaiki fungsi reproduksi pria.

Tujuan : Mengetahui perbedaan morfologi 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 yakni 1 (kontrol sehat), 2 (PSD 20 jam/ hari selama 5 hari), 3 (TSD 24 jam/ hari selama 5 hari), PSD + SR (20 jam/ hari selama 5 hari dilanjutkan dengan *sleep recovery* selama 5 hari berikutnya), dan TSD + SR (24 jam/ hari selama 5 hari dilanjutkan dengan *sleep recovery* selama 5 hari berikutnya)

Hasil : Rerata persentase morfologi spermatozoa normal terendah terdapat pada kelompok 3 ($13,00 \pm 2,91$), diikuti kelompok 5 ($14,40 \pm 2,70$), kelompok 2 ($18,00 \pm 1,58$), kelompok 4 ($21,00 \pm 1,58$), dan kelompok tertinggi adalah kelompok 1 ($22,60 \pm 1,14$). Uji *One Way ANOVA* menunjukkan terdapat perbedaan rerata yang signifikan ($p < 0,05$). Uji *Post-Hoc Tukey* menunjukkan adanya perbedaan rerata yang signifikan ($p < 0,05$) pada kelompok I-II, I-III, I-IV, I-V, II-III, III-IV, dan IV-V.

Kesimpulan : Terdapat perbedaan signifikan rerata persentase morfologi normal spermatozoa pada tikus putih (*Rattus norvegicus*) jantan pasca induksi berbagai model stres *sleep deprivation*

Kata kunci : Morfologi Spermatozoa, *Paradoxical Sleep Deprivation*, *Sleep Recovery*, *Total Sleep Deprivation*,

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

ABSTRACT

Background : Stress caused by paradoxical sleep deprivation (PSD) and total sleep deprivation (TSD) is able to increase oxidative stress, activate HPA, and disrupt HPG which is related to infertility. Sleep recovery (SR) can decrease free radical production by the mechanism of recovery of antioxidant levels there by improving male reproductive function

Objective : To know the difference of spermatozoa morphology 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 and control group design. Thirty male albino rats were distributed into 5 groups, group 1 (health control), group 2 (PSD 20 hours/day sleep deprivation for 5 days), group 3 (TSD 24 hours/day sleep deprivation for 5 days), group 4 (PSD + SR 20 hours/day sleep deprivation for 5 days continued with sleep recovery for the next 5 days), and group 5 (TSD + SR 24 hours/day sleep deprivation for the first 5 days continued with sleep recovery for the next 5 days)

Result : The lowest mean of normal spermatozoa morphology percentage was in group 3 ($13,00 \pm 2,91$), then group 5 ($14,40 \pm 2,70$), group 2 ($18,00 \pm 1,58$), group 4 ($21,00 \pm 1,58$), and the highest was group 1 ($22,60 \pm 1,14$). One way ANOVA showed significant differences ($p < 0,05$). Post-Hoc Tukey showed significant differences ($p < 0,05$) in group I-II, I-III, I-IV, I-V, II-III, III-IV, and IV-V.

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

Keywords : Paradoxical Sleep Deprivation, Sleep Recovery, Spermatozoa Morphology, Total Sleep Deprivation