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Evaluation of the effect of minocycline on resident intruder model of acute anxiety & Post Traumatic Stress Disorder (PTSD) in golden Syrian hamsters

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Statement of the Problem: Acute anxiety & Post Traumatic Stress Disorder are one of the most under-rated debilitating psychiatric conditions with world-wide prevalence approximated to 41%. PTSD generally occurs after severe psychological stress as observed in war veterans and people who have experienced severe natural or man-made disasters resulting in features like flashbacks, insomnia, nightmares and accompanied by co-morbidities like depression. Current line of treatment consists of short acting benzodiazepines for acute treatment along with long term treatment with selective serotonin reuptake inhibitors (SSRI) like fluoxetine. However, current treatment has variable efficacy & even aggregates certain symptoms like nightmares by increasing REM sleep. Thus, it is essential to either develop a new drug or check for off label application of currently used drugs.

Methodology & Theoretical Orientation: Resident intrusion model for induction of acute anxiety was used as this model has greater face validity and construct validity. Hamsters were used as they are solitary and territorial animals. All male hamsters were individually housed in ideal conditions with larger hamsters weighing >130 gm and smaller between 80-120gm. Smaller hamsters were exposed in the cage of larger dominant ones and changes in behavior of smaller submissive hamster were noted during five-minute pairing period. After resident intrusion, drugs were given to the hamster intraperitoneally. Normal saline was used as disease control, lorazepam (0.5 mg/kg) as positive control and minocycline (45 mg/kg) as test drug. The efficacy was checked by measuring serum cortisol levels within 24 hours of collection along with behavioral tests using open field and elevated plus maze (EPM).

Results & Conclusion: Cortisol levels showed significant difference between disease control group and positive control group. Also, there was significant difference between disease control group and minocycline group. However, no significant difference was found in cortisol levels between positive control group and minocycline group. The results for behavioral tests were on similar lines with time spent in open arm in EMP being significantly more in positive control & minocycline group compared to disease control without statistical significance between positive control group and minocycline group. Results in open field test were similar. Thus, efficacy of minocycline is similar to lorazepam.