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GREEN SYNTHESIS OF SILVER NANOPARTICLES BY TUALANG HONEY MODULATING HIPPOCAMPAL GLUTATHIONE IN KAINIC ACID-INDUCED SEIZURE IN MALE RATS

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❑ INTRODUCTION

Green synthesis of nanoparticles using plant-mediated process has been used for therapeutic and diagnostic purposes [1]. Recently, researchers have develop nanoparticles that can cross the blood-brain barrier [2]. Glutathione (GSH) is the most abundant antioxidant intracellular thiol in the brain [3]. It reacts with free radicals and protects cells from singlet oxygen, hydroxyl radical, and superoxide radical damage [3]. Tualang honey (TH), a potential natural antioxidant medicinal agent, has been shown to protect against neurodegenerative disorders [4,5]. Therefore, the present study aimed to explore the ameliorative effects of silver nanoparticles (AgNPs) synthesized using TH on glutathione level following kainic acid (KA)-induced seizure in the rats' hippocampus.

❑ METHODOLOGY

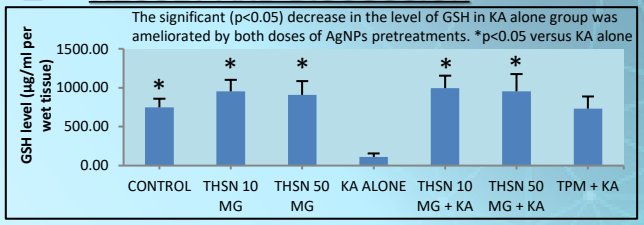
Sprague Dawley male rats (n=42) were randomly divided into seven groups:

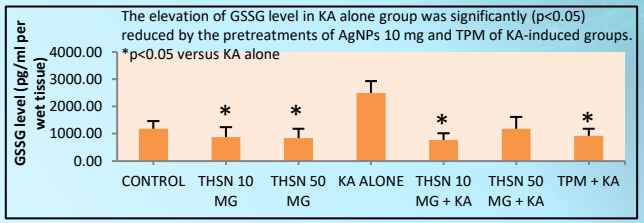
Group (1): control
Group (2): AgNPs 10 mg
Group (3): AgNPs 50 mg
Group (4): KA alone
Group (5): AgNPs 10 mg + KA
Group (6): AgNPs 50 mg + KA
Group (7): TPM + KA

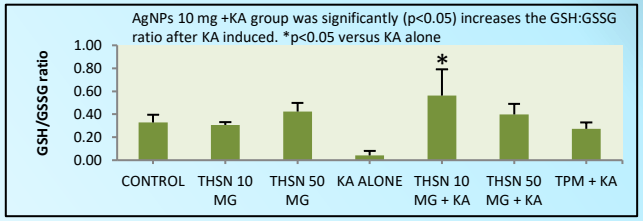
Each group were pretreated orally with either distilled water, AgNPs (10 mg/kg or 50 mg/kg) or Topiramate (TPM) (40 mg/kg), five times at 12 h intervals. Saline or KA (15 mg/kg body weight) were injected subcutaneously 30 min after last oral treatment.

All animals were sacrificed 24 h after KA injection and their hippocampus were harvested for determination the level of reduced glutathione (GSH), oxidized glutathione (GSSG) and GSH:GSSG ratio by using commercially available ELISA kits.

❑ RESULT AND DISCUSSION







It was reported that AgNPs synthesized using TH exhibited remarkable antioxidant activity with 1,1-diphenyl-2-picrul hydrazyl and reducing antioxidant power values of 95.54 ± 0.96 (%) and 1032.30 ± 102.76 µm Fe(II), respectively [6].

The improvement in GSH system by AgNPs suggested that its antioxidant properties possibly increased the brain's endogenous defence against KA-induced oxidative stress.

❑ CONCLUSION

In conclusion, AgNPs showed potential protective effects by modulating the glutathione system in the rats' hippocampus after KA-induced.

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