ISCOMS

science beyond borders

BOOK OF ABSTRACTS

24th International Student Congress Of (bio)Medical Sciences

Abstracts of student sessions

Postscript

Pharmacology II

Chair

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Protective effect of Metformin against spinal cord injury in male rats

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Introduction

Spinal Cord Injury (SCI) is a disabling disease that happens due to damage spinal cord resulting in loss of cord's motor, sensory and autonomic functions. Studies have shown that Metformin is an inhibitor of mammalian Target Of Rapamycin (mTOR) and this inhibition leads to attenuation of neuronal damage and locomotor impairment in spinal cord injury. Our objective is to investigate the effect of metformin on repair of rat SCI through inhibition of mTOR.

Material & methods

A total of forty-five male rats (weight 250-300g) were used in this study. Experiments were performed to determine a dose of metformin that effectively improves locomotor and sensory scores in rats with SCI. Therefore, rats received different doses of Metformin (10, 50,100 mg/kg intraperitoneal) or saline 1 hour before surgery. SCI was induced by compressing the T9 spinal segment with an aneurysmal clip for 60 seconds in anesthetized rats. After the surgery during four weeks of study Tail flick latency (TFL) and BBB (Basso-Beattie-Bresnahan) locomotor score were evaluated. Locomotor scores were determined at 1, 3,5,7,14,21 and 28 days after SCI. Spinal histopathologies were examined 30 days after SCI.

Results

our preliminary results showed an overall significant improvement in locomotor scores of rats with SCI was observed Within-Subjects repeated measures (P =0.004,) is observed. In the Between-Subjects analysis, medium dose metformin monotherapy (metformin 50 mg/kg) had a superior impact compared to low- and high-dose metformin (10 mg/kg and 50 mg/kg, respectively) and control saline on increasing locomotor scores at different intervals post SCI.

Conclusion

Studies have shown inhibition of mTOR reduces neuronal damage and locomotor impairment after spinal cord injury also producing neuroprotective effects and reducing secondary damage at the lesion. Although the effects of Metformin, a known inhibitor of mTOR which is also a safe known drug for diabetes, has never been studied in spinal cord injury. In this study we evaluated the therapeutic effects of metformin in SCI of rats. Results shows a presumably mTor inhibition induced improvement of locomotion through histopatholigicaly demonstrated neuroprotection and damage reduction. Metformin also showed to have protective effects against neuropathic pain which is a sensory complication of SCI