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Behavioral Study to Investigate Therapeutic Benefits of Quercetin in Preclinical Mice Model of Traumatic Brain Injury

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INTRODUCTION

Traumatic brain injury (TBI) is a brain insult induced by a direct or indirect external mechanical force which results in high percentage of disabilities worldwide. It is estimated that 69 million individuals suffer a TBI each year

OBJECTIVES

The purpose of this study was to examine the neuroprotective effects of quercetin in the mouse model of the TBI which were pretreated with quercetin for one week

METHODS

Our study investigated the mechanisms underlying the exacerbation of TBI injury by using a weight drop model. C57 mice were randomly arranged into three groups (9 mice/group) as follows: Group A [Non TBI +Vehicle] ,Group B [TBI + Vehicle] , Group C [TBI + Quercetin]. Quercetin was administered intraperitoneally at a dose of 50 mg/kg once daily for one week before TBI. The neurological impairment, spatial memory and locomotion activity of animals was assessed by using Y-Maze Test and Open Field Test (OFT). Western blot was used to assess (NF_{kB}) and (HO-1) in the brain homogenate of mice (Fig 1)

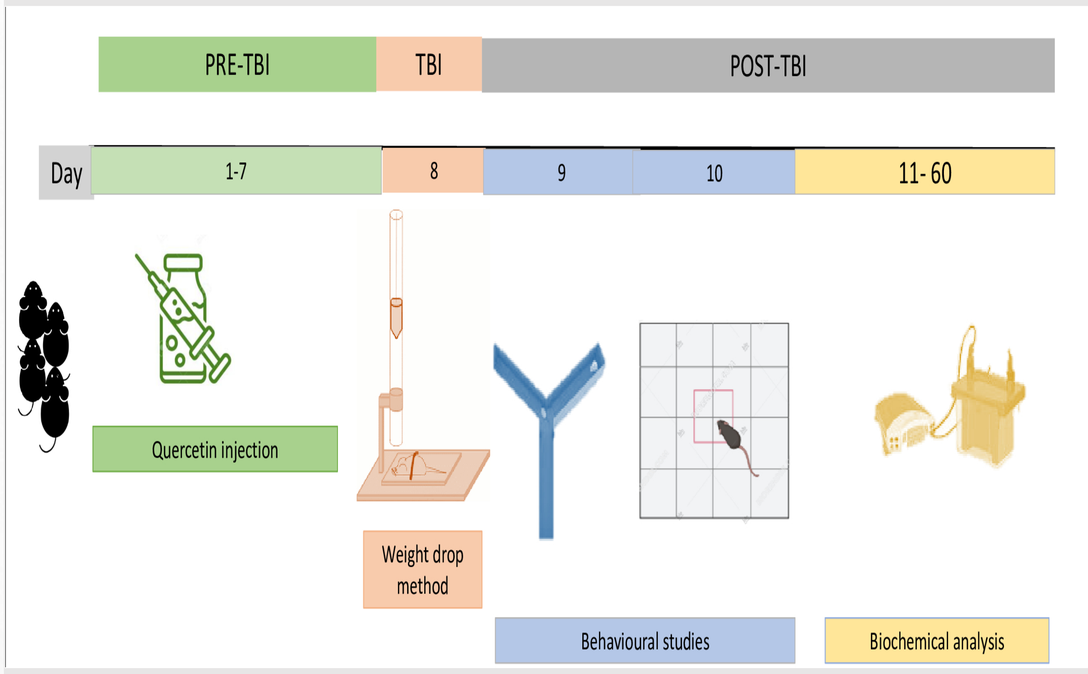

Figure 1. Graphic abstract for methodology

RESULTS

A once-daily (I.P) dose of 50 mg/kg of quercetin for one week before TBI reduced NF_{kB} levels in the mice brain between groups (Fig 2.C), but did not affect HO-1 levels (Fig 2.D). In the behavioral studies, quercetin did not affect mouse locomotion (Fig 2.A). However, there is an increase in SAP% in Y-maze for the treated group (Fig 2.B)

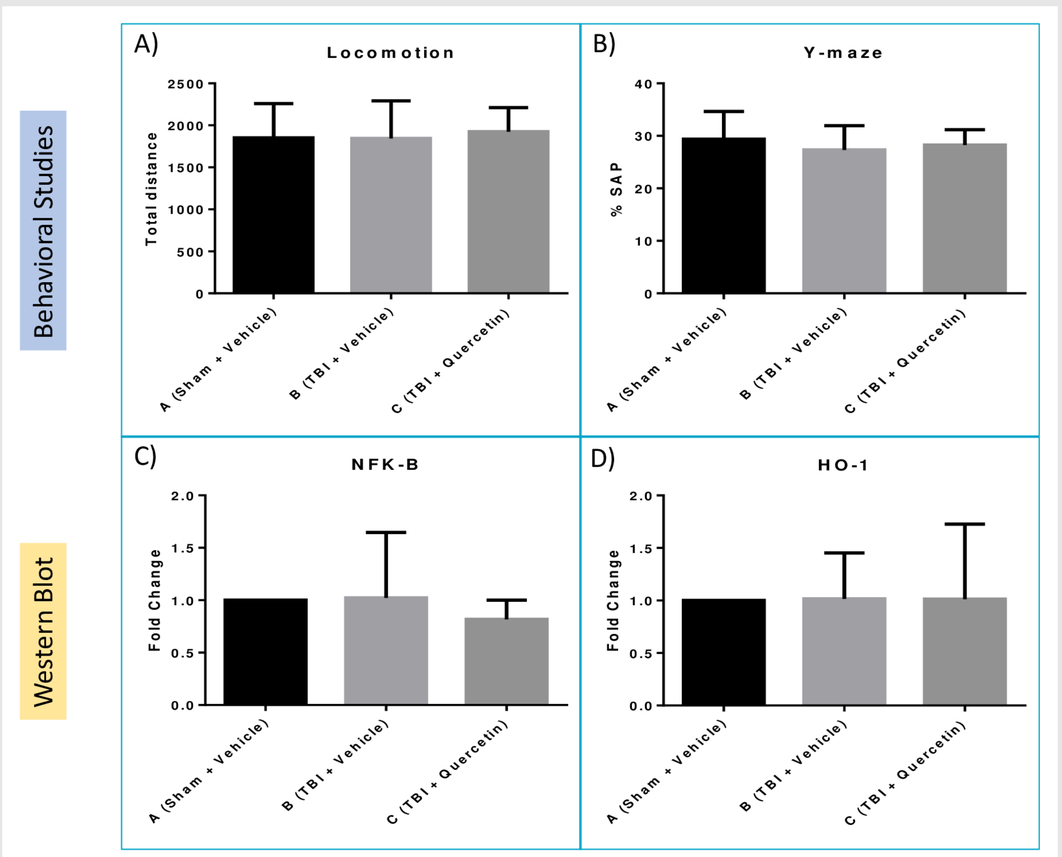

Figure 2. (A&B): The neurobehavioral effect of quercetin in the mouse model of the TBI. Statistical analysis was performed using one-way significant. ANOVA followed by the Tukey's post hoc test. *P value*< 0.05 compared with control group

Figure 2. (C&D): Effect of quercetin in the mouse model of the TBI on the expression of NF-kB and HO-1 protein. Statistical analysis was performed using one-way significant. ANOVA followed by the Tukey's post hoc test. *P value*< 0.05 compared with control group

DISCUSSION & CONCLUSION

Quercetin have a benefit against TBI in mice through enhancement of their memory and decreasing the inflammation in the brain

REFERENCES