

POSTER PRESENTATION

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Quercetin and Omega 3 ameliorate oxidative stress-induced neurodegeneration by Aluminium Chloride

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Background

Background Exposure to high levels of Aluminium (Al) leads to a neurodegenerative disorders, which may be mediated through over generation of free radicals. So in the present study we investigated the ability of both Quercetin and Omega 3 to ameliorate Al adverse effect on brain antioxidant through monitoring the main brain antioxidant enzymes on molecular and cellular levels.

Materials and methods

Forty male albino rats were used, they were divided into 4 groups; Control, Aluminum Chloride (AlCl₃) supplemented group that orally supplemented with 100mg of AlCl₃ (Sigma, St. Louis, MO) per Kg b.w. for two months. Quercetin group treated as AlCl₃ group and orally supplemented with 100 mg/kg b.w. Quercetin for two months according to Hui et al. [1] and Omega 3 group that treated as AlCl₃ and orally supplemented with 20 mg/kg b.w. Omega 3 for two months. At the end of the experiments,

brain samples were taken and used for biochemical and molecular analysis.

Results

Our results indicate a significant increase in superoxide dismutase (SOD) activity and MDA level and a significant decrease in the activities of catalase (CAT), glutathione reductase (GR) and glutathione peroxidase (GPX) and levels of reduced glutathione (GSH) in brain tissues in AlCl₃ supplemented group when compared with control or Quercetin and Omega 3 supplemented groups (Table 1). At the molecular level SOD mRNA showed the highest expression level in the AlCl₃ supplemented group while the highest expression levels of mRNAs of CAT, GPx and GR was observed in the Quercetin and Omega 3 supplemented groups (Figure 1).

Conclusions

Both Quercetin and Omega 3 has the ability to overcome the Al induced oxidative stress in brain, manifested by the

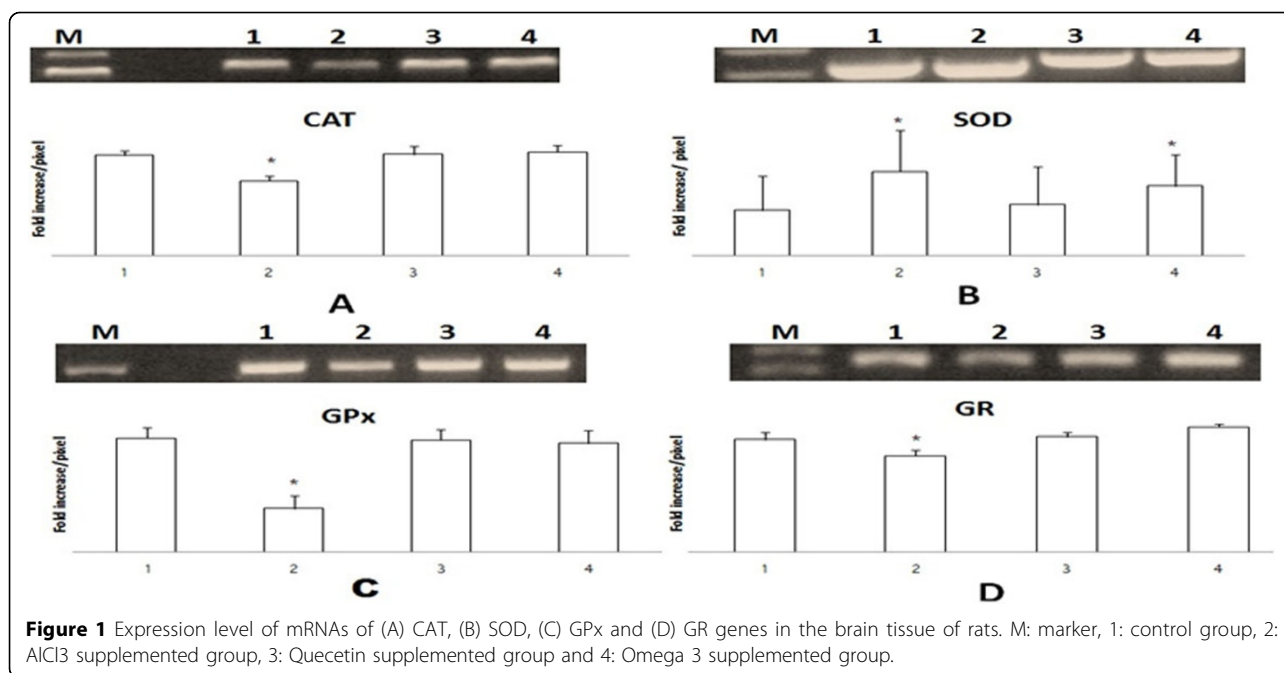
Table 1 Effects of ALCl₃, Quercetin and Omega 3 on antioxidants and MDA in brain tissues of rat.

Groups	GSH (umol/g tissue)	SOD (ug/g tissue)	CAT(μM H ₂ O ₂ decomposed/g tissue)	GPx (μM /min/g tissue)	GR (unit/g tissue)	MDA (nmol /g tissue)
Control	86 ± 3 ^a	0.45 ± 0.02 ^d	1.66 ± 0.01 ^a	51.4 ± 1.3 ^a	19.3 ± 0.7 ^a	5.4 ± 1 ^d
AlCl ₃ group	53.7 ± 2.2 ^d	0.93 ± 0.009 ^a	1.5 ± 0.014 ^d	26.7 ± 2.3 ^d	9.9 ± 0.3 ^d	29.9 ± 2.5 ^a
Quercetin group	75.4 ± 2.9 ^b	0.51 ± 0.007 ^c	1.6 ± 0.02 ^b	45.3 ± 0.6 ^b	16.3 ± 0.7 ^b	9.5 ± 1 ^c
Omega 3 group	68.6 ± 3.2 ^c	0.70 ± 0.016 ^b	1.58 ± 0.01 ^c	41.5 ± 0.9 ^c	13.9 ± 0.4 ^c	14.4 ± 2.5 ^b

Means in the column carry different subscripts are significant at P<0.05

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significant reduction in free radicals concentration and induction of the activity and gene expression of the brain antioxidant enzymes.

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Reference

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