بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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A Comparative study of Fish, Walnuts and Fenugreek oils on Attention Deficit Hyperactivity Disorder (ADHD)-like behavior induced by Monosodium glutamate in Rats

Thesis

Submitted to Faculty of Women - Ain Shams University in Partial Fulfillment for the Master degree in science (M.Sc.) in Biochemistry and Nutrition

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قال الله تعالى :

﴿ يَرْفَعِ ٱللَّهُ ٱلَّذِينَ ءَامَنُوا۟ مِنكُمْ وَٱلَّذِينَ أُوتُوا۟
ٱلْعِلْمَ دَرَجَٰتٍ ۚ وَٱللَّهُ بِمَا تَعْمَلُونَ خَبِيرٌ ﴿١١﴾ ﴾

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This work is dedicated to **the soul of my mother**, may God bless her soul.

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Abstract

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterized by inattention, hyperactivity and cognitive dysfunction. Monosodium glutamate (MSG) is widely used as flavor enhancer but consumption of high dose of MSG linked with behavior disorder which is known as ADHD. There are many sources rich in omega-3 fatty acids including fish, walnuts and fenugreek oils. Hence, the present study was proposed to examine the effects of fish, walnuts and fenugreek oil on ADHD which was induced by oral consumption of MSG in weaning male albino rats. The study included, first; identification of some free fatty acids content and antioxidant capacity in tested oils. Second; Animal trial 50 weaning male rats were divided to; two groups served as control groups one as a negative control and the other as positive control (fed on MSG containing diet 0.4 g/kg diet) and other three groups consumed MSG containing diet (0.4g/kg) plus one of the tested oils orally (at dose of 200 mg/kg body weight) by gastric tube for 8 weeks. Behavioral tests were carried out at the last 10 days before decapitation, then after decapitation brain tissues were collected for measurement of some biochemical parameters, gene expression and microscopic examination. The results of MSG-induced ADHD revealed that a significant ($P<0.05$) increase in feed intake, glutamate, inflammation, oxidative stress, apoptosis inducing factor (AIF) and glial fibrillary acidic proteins (GFAP) levels. On the other hand, there were a significant ($P<0.05$) decrease in behavioral tests, brain and body weight, calcium, neurotransmitters, brain derived neurotrophic factor (BDNF) levels as well as Bcl-2 gene expression. Also, nuclear pyknosis, and degeneration was found in neurons of brain tissue. Meanwhile, oral intake of the tested oils along with MSG containing diet showed a significant improvement in biological parameters and behavioral test. It also resulted in a significant reduction in inflammation, oxidative stress, pro-apoptotic factors and increment in calcium and neurotransmitters levels as well as Bcl-2 gene expression which might confirm their effect on the brain tissue as observed by microscopic examination. In conclusion, supplementation with fish, walnuts or fenugreek oils attenuated the pathologic effects induced by MSG in weaning male albino rats. The improvement was more pronounced in fenugreek oil supplemented group than other remaining groups, this due to their high content of antioxidant and free fatty acids.

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