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AMELIORATIVE EFFECTS OF AQUEOUS GARLIC EXTRACTS ON LEAD- INDUCED NEUROBEHAVIOURAL CHANGES IN WISTAR RATS

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ABSTRACT

Body exposure to heavy metals including lead has been found to cause adverse effects especially on the nervous system which is the primary target. The study was intended to evaluate the ameliorative effect of aqueous garlic extracts on lead-induced neurobehavioural changes in Wistar rats. Twenty five Wistar rats were randomly divided into five groups. Control group (C) received distilled water. Lead only (L) group received lead acetate (120 mg/kg). Lead low dose garlic (L+LG) and Lead high dose garlic (L+HG) groups received aqueous garlic extract at 300 and 500 mg/kg, respectively after pretreatment with 120 mg/kg lead acetate. Lead DMSA (L+ DMSA) group received succimer (30 mg/kg) after pretreatment with the 120 mg/kg lead acetate. Morris water maze and beam walk test were employed to assess the spatial learning and memory and motor coordination, respectively. Lead acetate caused significant ($p \leq 0.05$) changes on the spatial learning and memory and motor coordination compared with the control. In the Morris water maze test, there was a significant reduction of latency in the lead and aqueous garlic extract or succimer groups while rats that were exposed to lead acetate only had an increased latency. Beam walking test results also showed significant increases in the latency and foot slips of the treated groups compared with the control. These results clearly showed that the aqueous garlic extract could ameliorate the effects of lead acetate on spatial learning, and memory and motor coordination.

Key words: *Lead, Memory and learning, Succimer, Morris water maze, Beam Walking, Garlic*

INTRODUCTION

Lead poisoning (also known as plumbism, colica pictorum, saturnism, devon colic, or painter's colic) is a medical condition in humans and other vertebrates caused by increased levels of the heavy metal lead in the body (Karri et al. 2008). Lead can be found in air, drinking water, soil and many industrial by products such as pipes, storage batteries, pigments and paints, glazes, automobiles, vinyl products, ceramic, ammunition, cable covers and radiation shielding as well as many agricultural products (Salisu et al. 2015). It enter body mainly through eating, drinking or inhalation where its absorption occur primarily in gastrointestinal tract and respiratory tract. Once injected, it is carried in blood and transported to various tissues such as liver, kidney, bone and brain

(Saleh et al. 2018). Body's organs and systems exposure to heavy metals including lead has been found to cause a number of disturbances which include neurological, haematological, gastrointestinal, reproductive, circulatory, and immunological disorders (Owolabi et al. 2012).

Heavy metals have shown demonstrable neurological effects (Reddy et al. 2003), and behavioural disorders which include; deficits in learning, spatial memory and motor skills (Prasanthi et al. 2005). However, previous data suggested that the neurotoxic effects of lead are mediated through interference with cholinerg

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