

Psychological Effects of Lead Pollution on Mental Health of School Children in Mansoura City

Mohamad Farid.

Faculty of Medicine, Mansoura
University, Mansoura, Egypt.

Date received: 3/11/2008

Date accepted: 5/12/2008

Background: Several studies have been done to examine the effect of chronic accumulation of lead in the blood of children adolescence on their cognitive performance and behavior, and there some evidences since 1991 suggesting that children's intellectual ability, hyperactivity high blood lead concentration.

Aim of the study: is to estimate the prevalence of psychiatric disorder in school children of our culture and to find a relation between blood lead levels and these psychiatric disorders.

Subjects & Methods: A sample of 200 school aged children from different locations of Mansoura city were screened for psychiatric disorders using the multi-informant strength and difficulty questionnaire (SDQ) which classifies the studied sample into three main groups, normal, borderline, and abnormal. Those who showed high abnormal scores were exposed to further studies including: blood lead level assessment, socioeconomic

classification using Fahmy and Sherbiny scale and minimal state examination.

Results: The results obtained indicated high percentage of blood lead levels in studied groups (n=100) than in control group (n=44), with the average blood lead level ranging from (16.15: 34.88 ug/dl) in studied group to (12.27:15.5) in control group. Blood lead level was found to be positively correlated with SDQ scores, age and gender (affected males had higher blood lead level than affected females) and inversely correlated with both social class and minimal state scores.

Conclusion: Percentage of psychiatric disorders was considerably high in our school children and blood lead level correlates positively with the abnormal cases. Psychiatric disorders and blood lead levels are higher among low social standard communities, and the high blood lead level adversely affects cognitive abilities of children.

Keywords: Lead pollution, Psychological affect, School children, Mental health.

Abbreviations:

SDQ: Strength and Difficulty Questionair
MMS: Mini- Mental State Examination Test
BLL: Blood Lead Level

AV: Average
St-d: Standard Deviation

Egypt. J. Psychiatry, June 2009; 29(2): 55-64

INTRODUCTION

Lead is a ubiquitous and poisonous heavy metal. It is widely distributed in the environment (Air, soil, sediment, surface and ground water, food, dust, paint) and in biological systems. It occurs both naturally and as a result of human activities. One of the most common sources of human exposure to lead is through exhaust from use of leaded petrol (Needleman, 2004).

However this practice is being discontinued worldwide leaving the domestic environment (Through house paint, potable water and dust) as the main continuing source of lead exposure in many communities around the world While both adults and children can suffer from chronic low-dose lead exposure, the effect is more marked in children (Chen, 2007).

Children in Egypt can be exposed to these negative consequences which could continue into later adolescence and adulthood, even with modernization of our life. Although, increased interest in environmental sanitation with local and national efforts to decrease

pollution, still lead toxicity can be a potential hazard especially in areas of high exposure and in developing countries like our own, also strong evidences that violence, hyperactivity, criminality, conduct disorders, and learning disabilities are increasing nowadays which may be related strongly to environmental pollution, especially with lead. In this study we will screen for psychological disorders among school children and try to find whether they correlate with other factors in the studied group as it's relation to blood lead levels, socioeconomic standards and minimal state examination of the children.

Our nervous system is designed to be extremely sensitive and even low lead levels can adversely affect it during its maturation and thereby produce neurobehavioral abnormalities by different mechanisms including: direct toxic effect on neurons, as well as stimulating astrocytic and glial response. Adverse effect on neuronal ion metabolism, and inhibition of enzymes in the brain (Bellinger, 2004). Several factors lead to