بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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CYTOKINES ALTERATION AMONG RESEARCHERS OCCUPATIONALLY EXPOSED TO ORGANOPHOSPHORUS PESTICIDES

Submitted By

Nermeen Said Abdel Aziz Soliman

M.B.B.Ch., Faculty of Medicine, Cairo University, 1999

Master in, Pediatrics Faculty of Medicine, Cairo University, 2008

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Doctor of Philosophy Degree
In
Environmental Sciences

Department of Environmental Medical Sciences
Institute of Environmental Studies and Research
Ain Shams University

2021

APPROVAL SHEET

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Cytokines Alteration Among Researchers Occupationally Exposed To Organophosphorus Pesticides

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Nermeen said Abdel-Aziz

Abstract

Background : organophosphorus pesticides (OPs) exposure may be associated with an increased risk of immunotoxicity in the occupational workplace. **Objectives:** the study was designed to investigate cytokines alteration among researchers occupationally exposed to organophosphorus pesticides and comparing them with clinical symptoms and oxidative stress. **Methods :** clinical manifestations associated with pesticide exposure were collected from 49 researchers who were occupationally exposed to OPs (exposed group), and 51 non-exposed researchers (control group). The levels of cholinesterase enzyme (Acetylcholine esterase (AChE) and Butrylcholinesterase (BuChE)) have been estimated as biomarker for pesticide exposure. The oxidative stress status was evaluated by malondialdehyde (MDA) assessment, while total antioxidant capacity (TAC) could be an indicator of the antioxidant mechanism. The investigators used Interleukin – 6 (IL-6) and Interferon– gamma (IFN-γ) as immune biomarkersas well as Tumor Necrosis Factor-Alpha (TNF-α) as a biomarker of cellular immune function. **Results:** Our results revealed a significant decline in AChE, BuChE, and TAC levels, while there was a significant elevation in MDA in occupationally exposed researchers versus control group. In addition, the levels of IL-6, IFN –γ, and TNF-α have been increased in exposed researchers. From clinical examination, the chief morbidity was pertained to neurological disorders and bronchial asthma as a result of occupational exposure to OPs pesticides. Muscular weakness was significantly syndicated with the decline in AChE and BuChE levels. Bronchial asthma was closely associated with MDA, IL 6, and TNF-α. Furthermore, in numbness, MDA, IL-6, IFN-γ, and TNF-α, were

significantly higher. This study also indicated that MDA, IL-6, and TNF-α level were significantly boosted up in exposed researchers who were not wearing a mask. This could be a risk factor for some adverse health hazards. **Conclusion:** current study concluded that, the severity of exposure to OPs was associated with consumption rate of antioxidant mechanisms and increased disturbance rate of inflammatory cytokines especially IL-6 and IFN-γ. Also, bronchial asthma and neurological disorders were the most common clinical symptoms across exposed subjects. Furthermore, the use of PPE was observed to play an important in modulating immunotoxicity.

Keywords: Organophosphorus Pesticides, AChE, BuChE, Cytokines, Oxidative stress, MDA, TAC, Personal Protective Equipment (PPE)

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