

## Documents

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**Glyphosate Suppresses the Ability of PON1 to Hydrolyse Oxidized-LDL in the Exposed Farm Workers in Pahang, Malaysia**

(2023) *IJUM Medical Journal Malaysia*, 22 (3), pp. 105-113.

DOI: 10.31436/ijm.v22i3.2303

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**Abstract**

**INTRODUCTION:** Paraoxonase 1 (PON1) is a high-density lipoprotein (HDL)-associated enzyme which is known to hydrolyse most pesticides including organophosphates (OPs) and prevent atherosclerosis by inhibiting oxidative modification of low-density lipoprotein (LDL). Glyphosate is one of the common organophosphate pesticides used in agriculture in many developing countries including Malaysia. The aim of this study is to assess the PON1 ability to hydrolyse oxidized LDL in glyphosate exposed farm workers. **MATERIALS AND METHODS:** In this cross-sectional comparative study, a total of 103 subjects (53 Glyphosate-exposed and 50 non-exposed) were recruited. Fasting serum samples were analysed for PON1 activities towards substrates paraoxon, phenylacetate, and diazoxon, as well as for lipid profiles and oxidized-LDL (ox-LDL). **RESULTS:** The results showed lower basal paraoxonase activity [156.96 (58.87) vs 177.06 (66.78)], arylesterase activity [90.06 (17.14) vs 96.92 (23.87)] and diazoxonase activity [850.93 (206.75) vs 990.48 (248.73)] in glyphosate-exposed compared to non-exposed, however, only diazoxonase activity was statistically significant ( $p < 0.05$ ). PON1 activity is not significantly different with different length of period of exposure except for arylesterase. There was also significantly higher ( $p < 0.05$ ) ox-LDL in the exposed group but no significant differences in lipid profiles ( $p > 0.05$ ) between the two groups. The PON1 to ox-LDL ratio which probably reflects the ability of PON1 to hydrolyse ox-LDL were also significantly lower ( $p < 0.05$ ) among the glyphosate-exposed group. **CONCLUSION:** The results suggested that the decreased PON1 activity in glyphosate-exposed individuals could predispose them to the development of atherosclerosis and coronary artery disease through decreased PON1 ability to hydrolyse ox-LDL. © 2023, IJUM Medical Journal Malaysia. All Rights Reserved.

**Author Keywords**

farm workers; Glyphosate exposure; lipid profile; ox-LDL; PON1 activity

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35. Jan 1

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**Publisher:** International Islamic University Malaysia

**ISSN:** 27352285

**Language of Original Document:** English

**Abbreviated Source Title:** IIUM Med. J. Malaysia.

2-s2.0-85165054160

**Document Type:** Article

**Publication Stage:** Final

**Source:** Scopus

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