IIUM Research, Invention & Innovation Exhibition 2011

"Enhancing Quality Research & Innovation for Societal Development"

IIUM RESEARCH, INVENTION & INNOVATION EXHIBITION 2011

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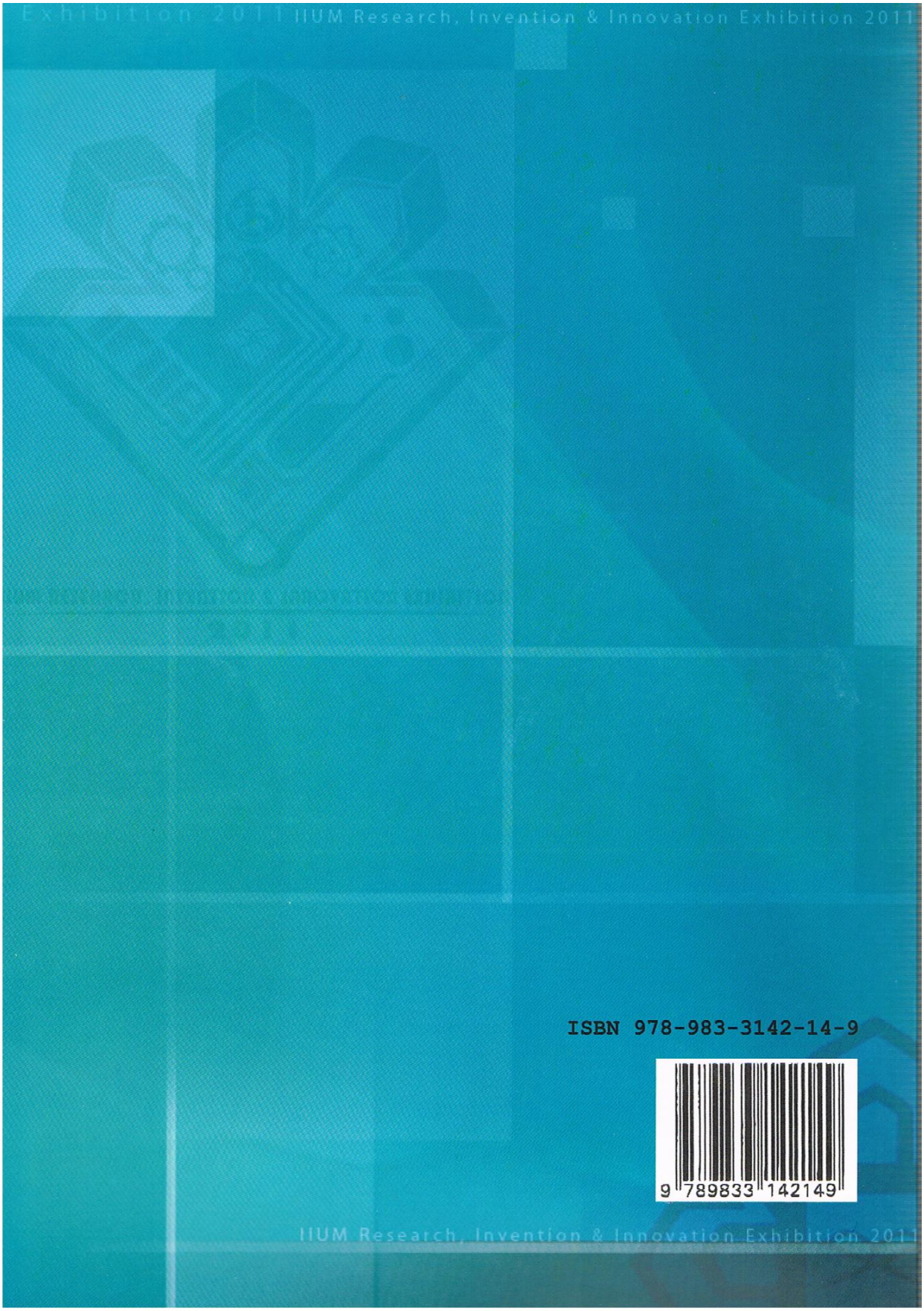

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P-141 Chronic Organophosphate Pesticide Exposure and Coronary Artery Disease: Finding a Bridge

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Organophosphates (OPs) are commonly used as pesticides in agriculture. They are hydrolyzed by paraoxonase (PON1) which is a high density lipoprotein (HDL) associated enzyme known for its function to hydrolyze OPs into a relatively harmless substance. PON1 is also known to prevent atherosclerosis by hydrolyzing oxidized-low density lipoprotein (ox-LDL) as well as preventing the accumulation of lipid peroxides on LDL. Reports showed low PON1 activity among OPs-exposed individuals, while low PON1 activity was associated with a high risk of coronary artery disease (CAD). The link between chronic OPs exposure and lipid parameters which are known risk factors of CAD has not yet been reported. This study aimed at comparing the activities of PON1 and lipid parameters (ox-LDL, TC, TG, LDL-C and HDL-C) between workers who are exposed to OPs and non-exposed comparative groups. A cross sectional study was carried among 53 selected pesticides sprayers from 4 farms in Kuantan who fulfilled the criteria and 50 control subjects whose age, ethnicity and income bracket-matched. Fasting serum samples were analyzed for TC, TG, LDL-C and HDL-C (lipid profiles), ox-LDL and PON1 activities after the hydrolysis of substrates paraoxon, phenylacetate and diazoxon. Results showed a significantly lower ($p<0.05$) diazoxonase activity (mean: 890.93vs 990.48 U/ml) and higher ox-LDL (median: 4.89 vs 2.83 mU/L) among the OPs-exposed group. The PON1 to ox-LDL ratio which probably reflect the ability of PON1 to hydrolyze ox-LDL were also significantly lower ($p<0.001$) among the OPs exposed group. There were no differences in lipid profiles ($p>0.05$) between the two groups. Our study suggested that OPs-exposed individuals might be predisposed to atherosclerosis and CAD through the decreased PON1 ability to hydrolyze ox-LDL but not through lipid profiles. A larger scale study is required to confirm our observation.