A Correlation Study : Levels of Butyrylcholinesterase and Paraoxonase 1 Activity amongst Shallot Farmworkers in Brebes Regency, Central Java, Indonesia

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Abstract	Organophosphate insecticides (OPs) are one of the pesticides commonly used in agricultural activities either to eradicate or to protect crops from insect attacks. Aside from the advantages proposed, this OPs substance also brings some worrisome threats for individual and population. Shallot farmworkers in Brebes Regency are population at risk to OPs exposure. The activity levels of Butyrylcholinesterase (BuChE) and paraoxonase 1 (PON1) in blood play important roles as a biomarker of exposure as well to measure the occurrence of OPs exposure in a human body and as a biomarker of susceptibility as well to measure the level of detoxifying OPs. The aim of this study was to analyse the correlation between levels of BuChE and PON1 activities amongst shallot farmworkers. A cross-sectional study was conducted on 88 male subjects selected randomly from Dukuhlo Village in Brebes Regency, Indonesia, occupationally exposed to OPs from April to May 2017. Using a structured questionnaire, a survey was carried out based on sociodemographic characteristics. Blood samples were collected to determine the levels of BuChE and PON1 activity. These samples were then analysed at laboratories of Cito in Tegal and Gaky, Undip in Semarang. Furthermore, data were analysed systematically using univariate and bivariate (a Spearman's Rank test). A significant correlation was found between these both variables (p=0.025 and rho=0.238) with slightly moderate positive relationship. To sum up, farmworkers with higher PON1 activity may have a better chance of detoxifying the acute effect of OPs exposure. A further research is needed to identify correlation between PON1 activity, levels of thyroid hormones, and OPs metabolites in urine.
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