

Analysis of the Relationship between Pesticide Exposure to Hemoglobin Levels in Potato Farmers in Kepakisan Village

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ABSTRACT

Background: Pesticides are widely used by potato farmers in Kepakisan Village to improve agricultural productivity, yet excessive exposure can negatively affect health, including hemoglobin (Hb) levels. This study aimed to analyze the relationship between pesticide exposure and Hb levels among potato farmers in Kepakisan Village.

Methods: This quantitative research used a cross-sectional design involving 71 male respondents selected through purposive sampling. Data were collected through questionnaires, anthropometric measurements, and laboratory analysis of Hb (Hemocue Analyzer Hb 201+) and AChE levels (Auto Analyzer TMS 50i Superior). Statistical analysis was performed using Spearman, Pearson, and multiple linear regression tests.

Results: The respondent's hemoglobin and AChE levels were mostly in the normal range. The results showed no significant correlation between pesticide exposure and Hb levels ($p=0.658$; $r=-0,053$), while AChE levels were positively and significantly correlated with Hb levels ($p=0.039$; $r=0.245$). Age also had a significant negative correlation with Hb levels ($p=0.017$; $r=-0.282$). Multiple regression analysis identified AChE ($p=0.045$; $\beta=0.231$) and age ($p=0.020$; $\beta=-0.270$) as the most influential variables, with age showing a stronger effect on Hb levels.

Conclusion: AChE activity and age significantly affected Hb levels among potato farmers, with older respondents tending to have lower Hb levels. It is recommended that local authorities strengthen occupational health programs through periodic medical check-ups, education on pesticide safety, and promotion of proper personal protective equipment (PPE) use to minimize exposure risks.

Keywords: pesticide exposure, hemoglobin, acetylcholinesterase (AChE), and potato farmer.