

Risk Factors Associated with Cockroach Sensitization

Wong Yi Ru, BSc, Kavita Reginald, PhD

Department of Biological Sciences, School of Medical and Life Sciences, Sunway University, Bandar Sunway, Selangor, Malaysia

ABSTRACT

Background: Sensitization to cockroach allergens is a risk factor for allergic disease development, which causes low quality of life. However, the risk factors for developing cockroach sensitization remains unclear. A systematic review of existing literature was performed to identify the different risk factors that contribute to cockroach sensitization. **Methods:** Articles were obtained from six health science databases. We included articles that were longitudinal and cross-sectional studies, published between 1999 to 2020, evaluated sensitization to cockroach allergens based on skin prick test or serum IgE assays and reported the risk factors associated with cockroach sensitization. Quality assessment, data extraction and meta-analysis were also performed. **Results:** A total of fifty-two studies reporting the prevalence rate and the risk associated with cockroach sensitization were included. In the pooled analysis, male gender (OR 1.89; 95% CI: 1.47-2.43, $p < 0.001$) was a significant risk factor while higher parental education (tertiary level) (OR 0.69; 95% CI 0.51-0.92, $p=0.0123$) was a protective factor for cockroach sensitization. No significant associations were identified in relation to ethnicity, area of residence (urban/rural) or tobacco smoke exposure. In the subgroup analysis of cockroach-sensitized individuals with helminth infection, *Trichuris trichiura* infection was a risk factor (OR 1.62; 1.26-2.09, $p < 0.002$) while hookworm infection was a significant protective factor (OR 0.77; 95% CI 0.63-0.94, $p=0.009$) for cockroach sensitization. **Conclusion:** Overall, male gender was a risk factor for cockroach sensitization while higher parental education level was protective against cockroach sensitization. The effect of infection of different species of helminth on cockroach sensitization could be attributed to its infection load. A higher parasite load has been shown to induce modified Th2 immune response, which could protect against sensitization to cockroach allergens. More studies investigating environmental factors are needed to gain a better understanding of other risk factors influencing cockroach allergen sensitization.