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Increasing Prevalence and Progression of Parkinson's Disease in Punjab- Is Pesticides the Main Etiology?: A Systematic Review

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ABSTRACT

Introduction: Parkinson's Disease (PD) is the second-most common progressive neuro-degenerative disorder, affecting the elderly population. The increasing prevalence of PD worldwide underscores the importance of identifying factors that influence disease outcomes and potentially leading to its progression. In recent years, Punjab, a prominent agricultural region in India, had witnessed a significant increase in onset of Parkinson's Disease. This trend had raised concerns about the potential contribution of environmental factors in its etiology.

Aim: The review study investigated the potential contribution of pesticides to the increasing prevalence and progression of PD in Punjab.

Materials and Methods: A comprehensive literature search in accordance with the PRISMA guidelines (2020) was conducted across multiple databases and search engines. From 2020 to 2025, articles published in English were reviewed in PubMed, Medline, EMBASE, Scopus and Web of Science databases. The review included the studies that explored association between pesticides and PD and on the studies that explored environmental risk factors for PD, particularly in agricultural regions like Punjab. Results: Ten articles (7 case control, 2 cross-sectional and 1 longitudinal cohort) were included and thoroughly reviewed. The literature highlighting pesticides as a major risk factor contributing to the rising prevalence of Parkinson's Disease cases were reviewed. The findings indicated a significant association between chronic pesticide exposure and increased PD risk. The studies have also shown that chronic pesticides exposure leads to the progression of both motor and non-motor symptoms in PD.

Conclusion: The review study strongly suggested that the prolonged exposure to pesticides is associated with the increased prevalence and progression of PD symptoms in Punjab. The review emphasised the need for awareness about pesticides as a significant contributor to the increasing prevalence of PD.

Keywords: Environmental factors, Neurodegenerative disroder, Risk factors