

Environmental Pollutants and Autism Spectrum Disorders: A Systematic Review and Meta-analysis

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Objective: to examine the effect of environmental pollutants on Autism Spectrum Disorder (ASD).

Methods: The PECOS strategy was defined in which "P": children and adolescents (0 to 18 years old); "E": higher levels of environmental pollutants; "C": lower levels of environmental pollutants; "O": incidence of ASD and "S" cohort studies. Studies from the following databases were included: COCHRANE CENTRAL, MEDLINE, CINAHL, LILACS, EMBASE, PsycINFO, Web of Science, SciELO, and gray literature from inception to January 2023.

Results: 5.780 studies were identified; 27 were included in the systematic review and 22 in the meta-analysis. These studies included 1.289.183 participants and 129 environmental pollutants. Individual meta-analyses found a significant association between nitrogen dioxide R.R. = 1.20 (95% CI: 1.03 to 1.38; I²: 91%), copper R.R. = 1.08 (95% CI: 1.03 to 1.13; I²: 0%), Mono-3-carboxy propyl phthalate β = 0.45 (95% CI: 0.20 to 0.70; I²: 0%), Monobutyl phthalate β = 0.43 (95% CI: 0.13 to 0.73; I²: 0%) and Polychlorinated biphenyl 138 RR = 1.84 (95% CI: 1.14 to 2.96; I²:0%) with ASD. Subgroup meta-analyses found a significant association with Carbon monoxide R.R. = 1.57 (95% CI: 1.25 to 1.97; I²: 0%), nitrogen oxides R.R. = 1.09 (95% CI: 1.04 to 1.15; I²: 34%) and metals R.R. = 1.13 (95% CI: 1.01 to 1.27; I²:24%).

Conclusion: Contaminants such as nitrogen dioxide, copper, Mono-3-carboxy propyl phthalate, Monobutyl phthalate, Polychlorinated biphenyl, Carbon monoxide, nitrogen oxides, and metals are associated with increased incidence of ASD.

Keywords: autism, environmental pollutants, systematic review, cohort studies.