Air pollution

see Air Pollution as a brain tumor risk factor.

Epidemiological research has shown that exposure to fine particulate matter pollution (PM2.5) is associated with a reduction in cognitive function in older adults. However, primary evidence comes from high-income countries, and no specific studies have been conducted in low and middle-income countries where higher air pollution levels exist.

To estimate the association between the exposure to PM2.5 and cognitive function in a nationally representative sample of older Mexican adults and the associated effect modifiers.

Data for this study were taken from the National Survey of Health and Nutrition in Mexico carried out in 2012. A total of 7986 older adults composed the analytical sample. Cognitive function was assessed using two tests: semantic verbal fluency and three word recall. The annual concentration of PM2.5 was calculated using satellite data. Association between exposure to PM2.5 and cognitive function was estimated using two-level logistic and linear regression models.

In adjusted multilevel regression models, each 10 µg/m3 increase in ambient PM2.5 raised the odds of a poorer cognitive function using the three-word memory test (OR = 1.37, 95% CI: 1.08, 1.74), and reduced the number of valid animal named in the verbal fluency test (β = -0.72, 95% CI: -1.05, -0.40). Stratified analyses did not yield any significant modification effects of age, sex, indoor pollution, urban/rural dwelling, education, smoking and other factors.

This study supports an association between exposure to PM2.5 concentrations and cognitive function in older adults. This is particularly relevant to low- and middle-income countries, which are marked by a rapid growth of their aging population and high levels of air pollution [1].

Spontaneous intracerebral hemorrhage (sICH) has a high mortality rate. Research has demonstrated that the occurrence of sICH is related to air pollution. This study used big data analysis to explore the impact of air pollution on the risk of sICH in patients of differing age and geographic location. 39,053 cases were included in this study; 14,041 in the Taipei region (Taipei City and New Taipei City), 5537 in Taoyuan City, 7654 in Taichung City, 4739 in Tainan City, and 7082 in Kaohsiung City. The results of correlation analysis indicated that there were two pollutants groups, the CO and NO_2 group and the PM2.5 and PM10 group. Furthermore, variations in the correlations of sICH with air pollutants were identified in different age groups. The co-factors of the influence of air pollutants in the different age groups were explored using regression analysis. This study integrated Taiwan National Health Insurance data and air pollution data to explore the risk factors of sICH using big data analytics. They found that PM2.5 and PM10 are very important risk factors for sICH, and age is an important modulating factor that allows air pollutants to influence the incidence of sICH [2].

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Salinas-Rodríguez A, Fernández-Niño JA, Manrique-Espinoza B, Moreno-Banda GL, Sosa-Ortiz AL, Qian ZM, Lin H. Exposure to ambient PM(2.5) concentrations and cognitive function among older Mexican adults. Environ Int. 2018 Apr 25;117:1-9. doi: 10.1016/j.envint.2018.04.033. [Epub ahead of print] PubMed PMID: 29704751.

2)
Chien TY, Ting HW, Chan CL, Yang NP, Pan RH, Lai KR, Hung SI. Does the Short-Term Effect of Air Pollution Influence the Incidence of Spontaneous Intracerebral Hemorrhage in Different Patient Groups? Big Data Analysis in Taiwan. Int J Environ Res Public Health. 2017 Dec 10;14(12). pii: E1547. doi: 10.3390/ijerph14121547. PubMed PMID: 29232865; PubMed Central PMCID: PMC5750965.