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Environmental and occupational risk factors for early onset dementia in an Italian community

Giorgia Adani[1], Tommaso Filippini[1], Caterina Garuti[1], Marcella Malavolti[1], Giulia Vinceti[2,3], Giovanna Zamboni[2,3,4], Manuela Tondelli[3,5], Chiara Galli[3,6,7], Manuela Costa[7], Marco Vinceti[1,8], Annalisa Chiari[2]

Background

Early onset dementia (EOD) is defined as dementia with symptoms onset before 65 years. Little is known about the etiological role of environmental and occupational risk factors. We aimed at assessing the role of these factors in disease etiology.

Methods

Using a case-control design, we recruited all EOD cases resident in Modena province from October, 2016 to October, 2019, as well as a referent population drawn from patients' care-givers. We investigated residential history of study participants, and their occupational and environmental exposures to pesticides, solvents and metals through a self-administered questionnaire. We computed the odds ratios (ORs) of disease risk, and the corresponding 95% confidence intervals (CIs), according to exposure to the investigated risk factors, using an unconditional logistic regression model adjusted for sex, age, and education.

Table 1. Baseline characteristics of study population

	Cases, n (%)	Controls, n (%)
All subjects	58 (52)	54 (48)
Age at questionnaire filling		
Mean (SD)	65.6 (5)	63.8 (10)
<65 years	22 (38)	28 (52)
>65 years	36 (62)	26 (48)
Age at disease onset		
Mean (SD)	59 (4.7)	
Sex		
Men	25 (43)	23 (43)
Women	33 (57)	31 (57)
Smoking habits		
Ever	35 (63)	30 (58)
Never	21 (37.5)	22 (42.3)

Abbreviations: EOD, early onset dementia; n, number of subjects; SD, standard deviation.

Results

Fifty-eight EOD cases and fifty-four controls agreed to participate. Among occupational factors, disease risk was associated with exposure to aluminum (OR 2.6, 95% CI 0.4-15.7), pesticides (OR 2.3, 95% CI 0.7-7.8) particularly from agricultural occupational exposure (OR 3.1, 95% CI 0.7-13.3) and dyes, paints or thinners (OR 1.7, 95% CI 0.6-5.0). Among lifestyles factors, smoking (OR 1.3, 95% CI 0.6-2.9) and playing football (OR 2.2, 95% CI 0.5-9.3) or cycling (OR 2.3, 95% CI 0.4-13.4) were associated with higher EOD risk, although overall sports practice appeared to be protective factor (OR 0.4, 95% CI 0.2-0.9). Risk was also positively associated with history of head trauma (OR 1.2, 95% CI 0.3-4.1) and particularly upper arm trauma (OR 2.2, 95% CI 0.7-7.5), but not overall trauma. No association emerged for exposure to electromagnetic fields.

Table 2. Odds ratio (OR) and 95% confidence interval (CI) of EOD risk in relation to exposure to environmental risk factors

Risk factors	OR[1]	(95% CI)
Aluminium	2.6	0.4-15.7
Pesticides	2.3	0.7-7.8
Agricoltural exposure	3.1	0.7-13.3
Dyes, paints or thinners	1.7	0.6-2.9
Playing football	2.2	0.5-9.3
Cycling	2.3	0.4-13.4
History of head trauma	1.2	0.3-4.1
Upper arm trauma	2.2	0.7-7.5
Smoking	1.3	0.6-2.9
Overall sport practice	0.4	0.2-0.9

[1]Adjusted for sex, age and educational attainment

Conclusions

Despite the study limitations, our results appear to support a role of environmental risk factors in EOD etiology, particularly of some chemical exposures and professional sports, while overall sports practice may have a beneficial effect.

Affiliations: [1]Environmental, Genetic and Nutritional Epidemiology Research Center (CREAGEN), Department of Biomedical, Metabolic and Neural Sciences, University of Modena and Reggio Emilia, Modena, Italy. [2]Center for Neurosciences and Neurotechnology, Department of Biomedical, Metabolic, and Neural Sciences, University of Modena and Reggio Emilia, Italy. [3]Neurology Unit, Modena Policlinico-University Hospital, Italy. [4]Nuffield Department of Clinical Neurosciences, University of Oxford, UK. [5]Primary care Department, Modena Local Health Authority Italy. [6] Department of Neuroscience, Psychology, Pharmacology and Child Health (NeuroFARBA), University of Florence, Italy. [7]Neurology Unit of Carpi Hospital, Modena Local Health Authority, Italy. [8]Department of Epidemiology, Boston University School of Public Health, Boston, Massachusetts.

Dr. Giorgia Adani, Department of Biomedical, Metabolic and Neural Sciences, Section of Public Health - University of Modena and Reggio Emilia, Via Campi, 287 – 41125 Modena. *giorgia.adani@unimore.it*