Environmental and occupational risk factors of amyotrophic lateral sclerosis: a population-based case control study

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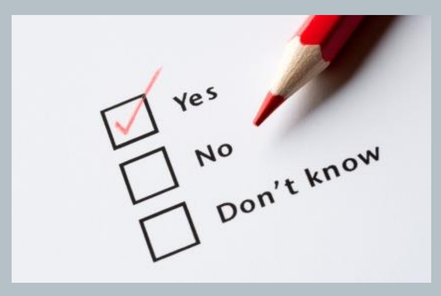
Background

Amyotrophic lateral sclerosis (ALS) is a progressive neurodegenerative disease of the motor neuron. Its etiology is still largely unknown, except for some rare forms of genetic origin, but environmental factors may have an important role.

Methods

We performed a population case-control study in three Italian provinces (Modena, Reggio Emilia and Catania) in order to assess the possible etiologic role of some environmental factors.

We administered 877 questionnaires by mail or by person in a neurological office to collect information about personal, clinical and professional history to ALS cases newly diagnosed in the 2008-2011 period and age- and sex-matched population controls.



Results

Analysis of the returned questionnaires (18,5%, 61 cases and 101 controls) showed an increased risk when examining clinical information for **reported trauma** (OR 1.20, 95%CI 0.63-2.30), **head** (OR 3.04, 1.23-7.55) and **chest trauma** (OR 2.65, 95%CI 0.72-9.78).
History of previous fractures has an OR of 1.10 (95%CI 0.58-2.11), but for **head fracture** OR raised to 5.17 (95%CI 0.53-50.88).

With reference to occupational history an excess of risk was found for **employment in agriculture** (OR 2.44, 95%CI 1.03-5.79) and for **welding** (OR 1.25, 95%CI 0.27-5.80).
Occupational exposure to lead (OR 1.27, 95%CI 0.74-2.17), **thinners** (OR 1.12, 95%CI 0.66-1.91) and **solvents (toluene/xylene)** (OR 1.24, 95%CI 0.72-2.13) provide some excess risk.

Considering 'extra-working' activities, we found an excess disease risk for **hunting** (OR 1.69, 95%CI 0.33-8.65), **painting** (OR 1.46, 95%CI 0.47-4.58), **modelling with glue** (OR 1.72, 95%CI 0.57-5.17), **gardening** (OR 1.15, 95%CI 0.64-2.08), **football** (OR 1.04, 95%CI 0.44-2.47) and **pesticides** (OR 1.98, 95%CI 0.76-5.12) and **herbicides use** (OR 2.27, 95%CI 0.72-7.19).

Table: Risk of Amyotrophic Lateral Sclerosis for reported risk factors.

		OR	CI95%	P values
Clinical information	Reported trauma	1.20	0.63-2.30	0.581
	Head trauma	3.04	1.23-7.55	0.016
	Chest trauma	2.65	0.72-9.78	0.145
	Right arm trauma	0.64	0.19-2.13	0.466
	Left arm trauma	1.69	0.33-8.65	0.529
	Right leg trauma	0.74	0.28-1.94	0.544
	Left leg trauma	0.81	0.29-2.28	0.689
Occupational history	Agricultural activities	2.44	1.03-5.79	0.044
	Welding activities	1.25	0.27-5.80	0.772
	Exposure to lead	1.27	0.74-2.17	0.380
	Exposure to thinners	1.12	0.66-1.91	0.670
	Exposure to solvents (toluene/xylene)	1.24	0.72-2.13	0.445
Extra working activities	Hunting	1.69	0.33-8.65)	0.529
	Fishing	0.71	0.33-1.50	0.364
	Painting	1.46	0.47-4.58	0.512
	Modelling with glue	1.72	0.57-5.17	0.333
	Oil-based paints use	0.30	0.04-2.20	0.234
	Gardening	1.15	0.64-2.08	0.646
	Football	1.04	0.44-2.47	0.926
	Pesticides use	1.98	0.76-5.12	0.161
	Herbicides use	2.27	0.72-7.19	0.164

Conclusions

Though these results must be assessed with caution for the risk of selection and information bias, they suggest potential etiologic clues to ALS etiology which are worthy of further study.

Bibliography

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