The Distribution of Purkinje Cell Loss in the Cerebellum in Autism

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Infantile autism is a disorder of early childhood associated with perseverative and stereotypic behavior, poor social interaction, and language impairment. Neuroanatomic findings to date have included evidence of Purkinje cell loss primarily in the lateral and inferior portions of the cerebellar hemispheres.

In order to more specifically localize the areas of Purkinje cell loss, we studied the cerebella of 4 well-documented autistic males, ages 12, 21, 25, and 29 years of age, in comparison with identically processed age- and sex-matched controls. Detailed cell counts were made in multiple areas of the cerebellar cortex in both normal and autistic brains. A diffuse loss of Purkinje cells was found throughout the entire cerebellum in all autistic brains. However, the most pronounced loss was found in the paraflocculus, flocculus, and areas below the horizontal fissure, where Purkinje cells were reduced by 50-95%.

Thus, in these autistic brains, Purkinje cell loss is most pronounced in areas of the archaeocerebellum and adjacent neocerebellar cortex. This regional predilection, therefore, appears to be unrelated to the phylogenetic and embryonic development of the cerebellum, and its significance in autism remains uncertain.

Risk Factors and Neurologic Diseases

Lack of Association of Alzheimer's Disease with Education, Occupation, and Marital Status

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To evaluate education, last occupation, marital status, and living arrangements as potential risk factors for Alzheimer's disease (AD), a case-control study was undertaken in Rochester, Minnesota. In the ongoing studies of AD in Rochester, using medical care records, all incidence cases (N = 199) (ADRDA-NINCDS criteria) were identified during 1975-79. One age/sex-matched control was selected for each case from registrations for care in the year of onset of the case; the control had to remain symptom-free of AD through the corresponding index year. The odds ratio for education, adjusted for age and sex, was 0.96 (95% CI, 0.72-27). Most male cases (98%) and controls (96%) were ever married, while 23% of female cases and controls were never married. The odds ratio for living alone/living with someone was 0.56 (95% CI, 0.19-1.66) for men and 1.04 (95% CI, 0.69-1.87) for women. More male cases lived in supervised living arrangements than controls, OR 2.25 (95% CI, 0.69-7.31); for women the OR was 1.19 (95% CI, 0.71-2.01). The distribution of last occupation was strikingly similar for cases and controls. Our results, in contrast to some other studies, fail to show an association between low educational level and AD.

Epidemiologic Study of Geographical Correlation Between Consumption of Herbicides and Paraquat and Parkinson's Disease (PD) Mortality Rates in Italy (Period 1969 to 1987)

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Some works have shown a positive correlation between PD and exposure to herbicides and pesticides. In this study, Italy was divided into five large areas (NORTHWEST, NORTHEAST, CENTER, SOUTH, ISLANDS). PD mortality rates from 1969 to 1987 (standardized on the 1981 Italian population census) for each of these areas were obtained from ISS (Superior Institute for Health). The consumption in grams per hectare of cultivated agricultural area of herbicides (1969-1986) and paraquat (1971-1986) was drawn from ISTAT (Central Institute for Statistics) yearbooks of agricultural statistics. Spearman's coefficient was used for temporal and spatial statistical correlation. The results of the research have shown a positive temporal correlation between consumption of herbicides and rates for Italy as a whole ($r = 0.676, p < 0.005$), NORTHEAST ($r = 0.616, p < 0.01$), CENTER ($r = 0.691, p < 0.005$), SOUTH ($r = 0.521, p < 0.05$), ISLANDS ($r = 0.509, p < 0.05$). The correlation, however, is negative for paraquat with the exception of the NORTHEAST ($r = 0.652$, $p < 0.01$). Two negative spatial correlations were found between the consumption of herbicides (1969) and rates (1987), and paraquat (1971) and rates (1987) in all twenty Italian regions. The results suggest an association between PD and substances with pyridilium (present in herbicides) rather than dipyridilium nucleus (paraquat).

Factor Analysis Identifies Neurological Syndromes in HIV Infection

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Numerous studies have been conducted in HIV-infected patients without AIDS and the findings are subtle and controversial. In a comprehensive study of 220 HIV-infected parental drug users without AIDS, we reviewed symptoms of cognitive, mood, and motor dysfunction as well as a survey of other neurological problems. When all the individual test scores were considered as dependent variables in a statistical model, the model was statistically complicated and unexplainable. Therefore, we sought a relatively small number of factors that could be used to represent relationships among many interrelated neurological signs. Using Principal Components Analysis, a method that simplified the structures (factors) underlying the data, we identified five uncorrelated factors. One factor represented a composite of all the symptoms elicited. Other factors included rapid alternating movement abnormalities, frontal release signs, cranial nerve abnormalities, and a combination of sensory and extrapyramidal signs. We conclude that factor analysis allows simpler statistical modeling and may help to identify neurological syndromes unique to HIV infection before the development of AIDS.