Early Linguistic Ability May Stall Later Dementia

BY MICHELE G. SULLIVAN

VIENNA — Good linguistic ability in early life seems to stave off the dementia of Alzheimer's disease, even when neuritic plaques and tangles are present in the brain.

The finding supports the theory that adequate cognitive reserve can delay or prevent cognitive decline in the elderly, Suzanne Tyas, Ph.D., said at the International Conference on Alzheimer's Disease. "Linguistic ability may be one of these early-life characteristics that reflects reserve capacity that can help us resist the clinical expression of Alzheimer's," said Dr. Tyas, an epidemiologist at the University of Waterloo, Ont. "We also found that these early-life factors interact with late-life factors, such as brain atrophy," to further inhibit the symptoms of Alzheimer's.

Dr. Tyas and her colleagues used the ongoing Nun Study as the basis of their analysis. The Nun Study examines aging and Alzheimer's disease in a cohort of 678 women who are members of the School Sisters of Notre Dame. All of the women have agreed to undergo an annual physical and cognitive assessment, and to donate their brains for study after death.

The sisters provide a unique population for studying factors that might affect cognitive decline, Dr. Tyas said. "It's a great study to look at early-life factors because these women had a relatively constant adult lifestyle between early-life cognitive factors and late-life dementia."

Dr. Tyas based her analysis on 180 deceased women who had handwritten autobiographies that they wrote around age 22—the time when they were postulants for their religious community. Of these women, 56 had brains that met the neuropathologic criteria for Alzheimer's disease. However, only 29 of those 56 had dementia at the time of death.

A linguist rated the autobiographies' linguistic complexity on two scales: idea density and grammatical complexity. Idea density referred to the number of ideas in each utterance; grammatical complexity referred to sentence structure. Each characteristic was scored in quartiles, with quartile 1 being the lowest complexity.

Among those in the lowest quartile of idea density, only 7% were nondemented, while 44% of those in the highest quartile remained nondemented. The findings were similar when examining grammatical complexity. Among those in the lowest quartile, 11% remained nondemented in the presence of neuropathologic Alzheimer's, compared with 33% of those in the highest quartile.

The investigators also looked at the interaction of linguistic ability and symptomatic Alzheimer's in the presence of brain atrophy.

Among those with atrophy and low grammatical complexity, 100% had dementia, Dr. Tyas said in an interview. "In comparison, only 45% of those with moderate to high grammatical complexity were demented. This difference was highly significant," with a *P* value of less than .002. "The pattern was the same for idea density, although the difference was smaller. The percentage with dementia was 91% of those with low idea density and 52% of those with moderate to high idea density."

The investigators then conducted a logistic regression analysis that compared the lowest quartile to the three higher quartiles. The model controlled for education, ApoE4 status, and age at death.

The model found that those in the top three quartiles of idea density were seven times more likely to have asymptomatic Alzheimer's at the time of their death than those in the lowest quartile. Those in the top three quartiles of grammatical complexity were eight times more likely to have asymptomatic Alzheimer's than those in the lowest quartile.

"While understanding the brain pathology of Alzheimer's is important, understanding the factors that affect the clinical expression of that pathology is just as critical," Dr. Tyas said. "Having AD pathology without the signs of dementia substantially reduces the impact of the disease on patients, their families and society, even though we are not stopping the development of the disease." ■