Editorial

Aging and the Public Health Effects of Dementia

DEMENTIA, and Alzheimer's disease in particular, is one of the principal causes of disability and decreased quality of life among the elderly and a leading obstacle to successful aging.[1,2] In the next 50 years, the prevalence of Alzheimer's disease in the United States is projected nearly to quadruple — which means that 1 in every 45 Americans will be afflicted with the disease.[3] This dramatic increase in prevalence will result primarily from the aging of the population. The percentage of Americans older than 75 years of age is predicted to increase from approximately 5.9 percent in 2000 to 11.4 percent in 2050.

Information about the probable duration of survival after the onset of dementia is obviously important for patients, families, and caregivers and for determining the public health and economic effects of dementia. Perhaps even more important than estimates of overall survival, however, are estimates of the duration of each of the progressive stages of the disease. The critical resources and intensity of care needed for patients with Alzheimer's disease depend largely on the severity of the disease.

In this issue of the *Journal,* Wolfson and colleagues examine the duration of survival among persons with Alzheimer's disease or vascular dementia who participated in the Canadian Study of Health and Aging.[4] Their results attest to the malignancy of dementia in the elderly. The study included all subjects who already had dementia at the time of sampling; thus, it focused on people already affected by the disease, rather than those with newly diagnosed disease. Therefore, a statistical adjustment was used to account for so-called length bias, which arises because persons who do not live long after the diagnosis tend to be excluded from studies of existing disease. After this adjustment, Wolfson et al. estimated that patients live a median of only 3.3 years after they first see a doctor regarding memory problems. By comparison, in previous studies, median survival had been estimated at between 5 and 9.3 years.[5,6] In the new study, the prognosis for patients with dementia was similar to that for patients with some of the most malignant diseases, including many forms of cancer and heart disease.

Despite the careful work of Wolfson et al., we believe that the estimate of 3.3 years for median survival must be interpreted with caution if we are not to underestimate the public health burden of caring for people with dementia. There are many difficulties in establishing the date of onset of the disease, particularly retrospectively. By definition, the onset of Alzheimer's disease is insidious and progression is gradual.[7] Investigators use a variety of strategies to identify a precise date of onset for a disorder that does not appear to have one.[8] Dating the onset from the time of the first presentation to a physician, as was done in this study, probably underestimates the duration of illness for most patients, because the majority of people with Alzheimer's disease have symptoms for several years before receiving a diagnosis.[9] Various social and cultural factors can keep some from acknowledging the difficulties they are encountering and can thereby cause even longer delays in seeking help. And although some patients with Alzheimer's disease, particularly the oldest, may die within three years after receiving the diagnosis, many patients, particularly those in whom the onset occurs at an early age, live for a decade or more with the ravages of severe dementia.

The main determinant of survival and mortality in elderly populations, regardless of the presence of dementia, is age. Wolfson et al. found that the duration of survival after the onset of dementia is considerably longer among patients with onset at an early age than among those with a later onset. Their finding of a survival time of 3.3 years after onset represents the median survival of the entire study population, of which the mean age at the time of sampling was 83.8 years. They did not formally compare the mortality rates among the subjects with dementia in their study with the rates in a group of people of similar ages without dementia. For example, in the United States, the median number of remaining years of life for all 80-year-olds is approximately 7.0 years; for 85-year-olds, it is 5.0 years. Although dementia unquestionably shortens life expectancy, a 3.3-year median survival must be interpreted in the context of an elderly population and compared with background mortality in a similar group of people without dementia.

Ideally, to estimate survival, one must study cohorts of healthy elderly persons who are prospectively monitored for the incidence or onset of dementia, with follow-up continuing until death. When subjects are not prospectively monitored, as in the study by Wolfson et al., some of those in the earliest stages of disease may not be identified by the screening procedure at the time of sampling. If mild cases are being missed because of the low sensitivity of the screening instrument, it is even likely that the subjects with more slowly progressive disease may be excluded, resulting in a potential underestimation of survival that is not accounted for by the statistical adjustment. Only about 20 percent of the subjects with dementia in this study were classified as having mild disease. If that figure is correct, it would imply that the duration of the mild stage of disease is only about one fifth of

that of the entire course of the disease. In the context of the estimate of a median survival of 3.3 years, this suggests a surprisingly short duration of mild-stage disease — perhaps only several months. Prospective studies of incidence are needed to clarify the duration of each stage of the illness, as well as the resulting public health burden.

In the 20th century, there were truly remarkable achievements in extending life expectancy. Future progress in meeting the public health challenges of dementia should be measured not merely by the extension of the life expectancy of patients with severe dementia, but by improvements in the quality of life for patients and their caregivers and by progress toward primary prevention of disease. In the past few years, the first clinical trials for the primary prevention of Alzheimer's disease and dementia have been initiated. The potential usefulness of hormone replacement,[10] antiinflammatory drugs, and *Ginkgo biloba* for the prevention of Alzheimer's disease is currently being studied. Further information about these studies is available from the Alzheimer's Disease Education and Referral Center of the National Institutes of Health (http://www.alzheimers.org/ir.html or 800-438-4380). A vaccine strategy based on immunization with β-amyloid has been developed and is now being tested in trials in humans.[11] These and other promising areas of investigation bring hope that, in the near future, we will be able to turn our attention from the palliative treatment of Alzheimer's disease to primary prevention, or at least to delaying the progression of the disease to its most disabling stages.

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