NEUROEPIDEMIOLOGY OF DEMENTIA. CONTRIBUTIONS AND PROBLEMS

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ABSTRACT

The progress of clinical, neuropsychological, and imaging diagnostics of degenerative dementia, the development of neurogenetics and neurobiochemistry, the elaboration of newer, more precise diagnostic criteria, have determined the increasing interest for research, diagnostics and seeking of effective treatment. Alzheimer's disease, the most frequent type of dementia, is a typical example for the importance of neuroepidemiology. For the first time in AD dependence was found between frequency and advanced age. Differences were also established between AD cases and people with normal cognition, despite their advanced age. Intense neuroepidemiological studies of dementia in different regions of the world have been published in the literature during the last years. The availability of information on prevalence, incidence, mortality, gives possibilities for further investigation of specific regularities in the appearance and the development of dementias. Neuroepidemiological studies have provided information used to determine the prognosis, and to set up the basis for medical, social and personal planning. Neuroepidemiology has to resolve numerous problems, including difficulties related to migration and instability of demographic data in modern world, difficult access to samples for large studies, lack of quick and easily applicable criteria for the establishment of a definite diagnosis. In regions of dominating economic and social difficulties, society and governments often underestimate the social importance of dementias and dementia research.

INTRODUCTION

Dementia is considered to be one of the greatest challenges for modern health care. The progress of clinical, neuropsychological, and imaging diagnostics of degenerative dementia, the development of neurogenetics and neurobiochemistry, the elaboration of newer, more precise diagnostic criteria, have determined the increasing interest for research, diagnostics and seeking of effective treatment. (6,8,9,10) As the disease advances, cognitive and behavioral disturbances lead to progressive loss of independence, to necessity of additional care, to lower quality of life, important disability and mortality, which turns dementia into a heavy social and health burden. (9) The importance of this disease is underlined by the observed tendency of increase in life expectancy, which leads to a significant rise of the relative share of aged population - not only in developed countries, but also in developing ones. (3,7)

Alzheimer's disease is a typical example for the importance of neuroepidemiology. For the first time in AD a dependence was found between frequency and advanced age. Differences were also established between AD cases and people with normal cognition, despite their advanced age. AD was found to be the most frequent type of dementia, reaching 80% worldwide. (1,6)

Together with the increased attention toward the elaboration of novel therapeutical approaches and the improvement of patients' quality of life, medical community and society become aware of the need for new precise data on prevalence, incidence, mortality, age distribution of dementias. Intense neuroepidemiological studies of dementia in different regions of the world have been published in the literature during the last years. They apply the methods of descriptive epidemiology, presenting single cases in the context of population, as well as analytical epidemiology, examining causal relationships between different factors. (2,6,8)

Major contributions of neuroepidemiological studies in dementia

Neuroepidemiological studies in European countries, USA, Japan, India, Egypt, etc., have allowed confident data on the principal parameters of dementias to be obtained, e.g. prevalence, incidence, mortality. The availability of such information gives possibilities for further investigation of specific regularities in the appearance and the development of dementias. The prevalence of dementia, reported in different studies, varies between 3.8% - 10%, and the prevalence of Alzheimer's disease (AD) - between 2.1% and 7%. The incidence of dementia increases with age and doubles each five years after the age of 65. It has been confirmed that about 5.1 million people with dementia live in the Eu-

ropean union. Their number is expected to reach almost 12 million in the following 50 years. (1-5)

Neuroepidemiological studies have encouraged the development and the elaboration of methods of neuropsychological assessment by multiple evaluations of their sensitivity and specificity. They have contributed to the validation of different tests and batteries for screening and early diagnosis of dementia.

Neuroepidemiological studies have played a role in the creation and improvement of criteria for precise diagnostics of different dementia subtypes: NINCDS-ADRDA criteria for AD; NINDS-AIREN criteria for vascular dementia; criteria proposed by McKeith et al. for diffuse Lewy body disease, criteria proposed by the Lund and Manchester groups for frontotemporal dementia, etc. (6,8)

Similar studies have provided information used to determine the prognosis, and to set up the basis for medical, social and personal planning.

Neuroepidemiological studies have contributed to the identification of risk factors for the development of dementia. The major risk factor for all dementia types, including AD, is age. The frequency of AD and vascular dementia grows exponentially between 65 and 85 years of age. The prevalence of dementia among the population between 90 and 95 years reaches 30% to 40%. Sex is also considered as a risk factor. Most studies show that women are at a higher risk for dementia in general, while men are more susceptible to vascular dementia. The risk for dementia in uneducated individuals older than 75 years is double, compared with those having at least 8 years of education. The risk for AD is four times higher in individuals having siblings, mother or father affected by the disease. Numerous other risk factors have been identified, such as: ApoE 4 allele presence, co-existing vascular diseases, food preferences. (1,6,7,9,10)

Practical problems of neuroepidemiology in dementia

Together with the strictly scientific challenges, neuroepidemiology has to resolve some problems. These include difficulties related to migration and instability of demographic data in modern world, difficult access to samples for large studies, lack of quick and easily applicable criteria for the establishment of a definite diagnosis.

In regions of dominating economic and social difficulties, society and governments often underestimate the social importance of dementias and dementia research. Difficulties are sometimes present in categorizing persons with cognitive impairment, not conforming to dementia criteria. The main reason for this is the uncertainty whether they would develop dementia in the course of time, or they would remain as a variation of normal aging. (2,6,8,9)

CONCLUSION

Published data from epidemiological studies on dementia confirm their high frequency among the population and de-

termine their social importance for the adequate planning and organization of health care.

Neuroepidemiology of dementia has shown a rapid development for the last two decades. With the application of contemporary large studies using refined methods of assessment and statistical analysis, it has become an important branch of dementology. Its place in the field of interest of epidemiologists and neurologists is determined not only by the medical, social, and economical importance of dementia, but also by the key contributions and the major problems still to be resolved.

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