

EDITORIAL

The problem of mild dementia¹

Because of the worldwide increase in the proportion of elderly in the population, the prevalence of dementia is rising markedly. It is therefore welcome that biomedical and epidemiological research on dementia has become more intensive, with evidence of some recent progress in both these fields (Henderson, 1983). An area of particular research interest is mild dementia. Although this term is already in common usage in the clinical and epidemiological literature, there are certain difficulties about the concept: there are no specific criteria by which its presence can be asserted; it is not itself a diagnosis, but rather a rubric for the early stages of several neuropathologically distinct disorders; and little is known about its natural history. The single common feature in mild dementia is the presence of mild cognitive impairment, presumed to be a decline from a formerly higher level of functioning. Although there are appreciable problems in method which first require to be overcome, mild dementia promises to be a rewarding area for epidemiological study.

THE NEED FOR ACCURATE ASCERTAINMENT

The desirability of accurate ascertainment is compelling. First, a realistic estimate of the prevalence within a community carries administrative significance, in that persons with mild dementia merit extra attention from health and social services. Secondly, the recognition of mild dementia carries implications for a physician's management of the patient and his relatives. It should influence the choice of medication, because some drugs are known to worsen cognitive performance (*Lancet*, 1982). Thirdly, the natural history of mild dementia is unclear. It is uncertain whether all such cases proceed to a moderate or severe dementia (Kay, 1962; Bergmann *et al.* 1971; Bergmann, 1977; Gurland, 1981). In particular, little is known about features which, at ascertainment, might differentiate a benign course from a more rapid deterioration. Lastly, a reliable and valid method of ascertainment may shortly become important if there is success in developing a specific pharmacological remedy to enhance memory. This prospect arises from recent advances in understanding the neurochemical basis of senile dementia of Alzheimer type (SDAT) (Rossor, 1982). For these reasons, clinical and epidemiological studies of mild dementia are now needed. But the results of any systematic study of the prevalence, natural history or treatment of mild dementia will depend on the material included as cases. Insofar as possible, therefore, homogeneity between samples is desirable if findings are to be compared. Such homogeneity can be achieved only by adherence to standard criteria and case-finding methods.

The need for these is well seen in the epidemiological data so far available for mild dementia. Field surveys of elderly populations have yielded a remarkably consistent rate of about 5% for the prevalence of moderate and severe dementia (Henderson, 1983; Kay & Henderson, 1983). In contrast, the rates reported in Britain and Scandinavia for mild dementia have varied from 2.6% in the study by Bergmann *et al.* (1971) to 21.9% (Parsons, 1965). Kaneko (1969, 1975) reported an extremely high rate of 52.7% in a community sample of 531 persons aged 65 and over in Japan. Studies with rates between these extremes have been reported by Essen-Möller (1956), Nielsen (1962), Kay *et al.* (1964), Williamson *et al.* (1964) and Helgason (1964). In all of these surveys only a general indication was provided on how cases of mild dementia had been recognized.

In two studies which reported age-specific rates (Essen-Möller, 1956; Nielsen, 1962), the

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prevalence was found to fall abruptly in persons aged 85 and over. If it is assumed that both the criteria and methods for ascertainment were constant over all age-groups, and that the duration of the state of mild dementia does not change appreciably across age-groups, this finding suggests that the incidence may actually fall in the very old.

While the apparent variation in overall prevalence rates might be partly due to different proportions of the very old in the populations sampled, this explanation is unlikely. There seems no reason for this to apply only to mild dementia but not to the moderate or severe categories, where prevalence rates are much more consistent. The main source of variation is likely to be due to differences first in the criteria and secondly in the methods used to identify cases of mild dementia. Because it is not a distinct diagnostic category, there is no specification for mild dementia in the Diagnostic and Statistical Manual (DSM-III) of the American Psychiatric Association (1980), or in the Glossary of the ICD-9 (WHO, 1974). Indeed, the principal characteristic of mild dementia, a modest impairment of memory and other aspects of cognition, is shared with several other states. The first of these is clouding of consciousness from medical disorders or medication. Such states may be common in an age-group with a high prevalence of cardiovascular and respiratory disease, while in developing countries parasitic diseases and malnutrition probably lead to impaired cognition in the elderly. Iatrogenic clouding may be induced by hypnotics, psychotropic drugs and any preparation with anticholinergic properties (*Lancet*, 1982). Secondly, there is ample evidence that depressive illness can be accompanied by cognitive impairment, at times leading to a pseudodementia (Kiloh, 1961; Wells, 1979; Caine, 1981; McAllister & Prince, 1982; Reifler *et al.* 1982). In our own study of the reliability of a standardized psychiatric interview on 47 day-patients (Henderson *et al.* 1983) the item 'Have you had any difficulty with your memory?' correlated 0.55 ($P < 0.001$) with the depression score (Spearman coefficient), but only 0.21 (NS) with the score for cognitive impairment. Conversely, it is important to bear in mind that depressive symptoms may be a prominent feature in cases of mild dementia, particularly where the individual is aware of his impairment. Thirdly, there is the important problem of distinguishing mild dementia from what may be normal ageing. Kral (1962, 1978) described a state he called benign senescent forgetfulness, characterized by occasional dysnomia and difficulty in recalling parts of past episodes, with no such difficulty at other times. This state is said not to carry the downward course and increased mortality of dementia. We believe that insufficient information is at present available for the validation of this category of cognitive impairment. Yet the possibility that it exists is clearly of great importance in detecting cases of mild dementia, from which it is said to be distinct. Lastly, several authors have found that persons who were first classified as cases of mild dementia were later found to have limited intelligence or education (Bergmann *et al.* 1971; Anthony *et al.* 1982). Gurland (1981) cites a number of studies in which less well educated persons were diagnosed as mildly demented more often than those who were better educated. The task for epidemiology, then, is to develop a method for identifying cases of mild dementia free of contamination with other diagnoses and independent of previous levels of intelligence or education. We shall consider first the criteria being used, and then the instruments currently available.

THE CRITERIA

Here, a dilemma has to be faced. The condition can be studied only if there is a method for identifying it reliably and validly. However, until longitudinal studies have been conducted, we do not know which features will turn out to be the distinctive ones. Therefore, if progress is to be made, criteria will have to be chosen in the full knowledge that they are only tentative at this stage. Reliability will thereby be improved, but the validity of the method can be assessed only later.

Some attempts have recently been made to set up working criteria in the course of developing standardized interviews or clinical assessments. For the Comprehensive Assessment and Referral Evaluation (CARE) (Gurland *et al.* 1977), Gurland *et al.* (1982) have proposed the following five features to make a diagnosis of 'Limited Cognitive Disturbance', which is the state less severe than 'pervasive dementia' and which we have therefore taken as synonymous with, or at least to include,

mild dementia. The respondent (1) reports a decline in memory; (2) has increased reliance on notes as reminders; (3) occasionally (less than once a week) forgets names of acquaintances, forgets appointments or misplaces objects; (4) occasionally (less than once a month) has destructive or dangerous memory lapses such as burning cooking or leaving on gas taps; and (5) has one or two errors on cognitive testing: forgets current or past President, exact date, phone number, post code, dates of marriage or moving to present location, or cannot remember interviewer's name even on third challenge. It is not specified how many of these features have to be present for a rating of Limited Cognitive Disturbance to be made. The Guide Notes for the CARE make it clear that such a person may still perform adequately in daily living, requiring little or no supervision.

With the Geriatric Mental State Examination (GMS), developed by Copeland *et al.* (1976), no criteria have yet been proposed for diagnosing mild dementia, but an algorithm like the CATEGO/ID system on the Present State Examination (Wing *et al.* 1974) is in preparation by Copeland and his colleagues. This will specify the features required for cognitive defect at different levels of severity on the Index of Definition. Reisberg *et al.* (1982) have developed a global deterioration scale for primary degenerative dementia in which they set out the clinical characteristics and 'psychometric concomitants' of very mild and mild cognitive decline. In the first of these there are subjective complaints, but no objective evidence of memory deficit, together with below-average performance for age on the Wechsler Adult Intelligence Scale. In mild cognitive decline objective evidence of deficit is required, characterized by more than one of the following: becoming lost in an unfamiliar situation; co-workers being aware of impaired performance; intimates notice difficulty in word and name finding; poor recall of material recently read; inability to remember names on being introduced; losing or misplacing possessions; and defective concentration in clinical tests. These criteria can be criticized for placing too much weight on memory, which is only one aspect of cognitive function. Indeed, a reasonable hypothesis is that memory difficulty is common in both normal and mildly demented elderly persons, but that it is only the latter who have additional deficits in language, reasoning and spatial ability. A wider representation of cognitive function is therefore desirable.

Hughes *et al.* (1982) have proposed characteristics of 'questionable' and of mild dementia in the course of their prospective study of the latter. These features are: mild to moderate impairment in the spheres of memory, orientation, problem-solving, community engagement, performance at home and in recreation and personal care. A guide to the rating of these has been set out. These authors emphasize that validation of both the instrument and its component ratings can come only from a longitudinal study. Their criteria have the merit of carrying high face validity and of being based on a wide sample of cognitive performance in daily life.

From the above, it is clear that several sets of criteria are already in use. There is no certainty that these are leading to the identification of a homogeneous group of equivalent severity. It may not be sufficiently appreciated that the proposed diagnostic features of mild dementia have little empirical basis. They can be regarded only as working hypotheses.

INSTRUMENTS IN USE

Several standardized interviews have been developed which provide a psychiatric assessment in a systematic manner, including cognitive function and affective state. The best known are the GMS and the CARE. Neither has so far been assessed for its reliability and validity in the ascertainment of mild dementia. It is a weakness that both interviews have a heavy representation of self-report items on memory, which is unlikely to help in the differentiation of dementia from depression (Kahn *et al.* 1975). Both instruments include a number of objective items, such as requiring the respondent to provide his or her address, the name of the interviewer and of the current Prime Minister. But these are unsatisfactory in that the difficulty of such items will vary between respondents and over time: some will have moved to a new address more recently than others; interviewers do not all have a standard surname; and the social salience of Prime Ministers is greater near elections or at times of national crisis. Further work will therefore be necessary to develop criteria and interviews

free from such flaws. Self-reported items and some general cognitive questions are likely to prove too coarse for what is a demanding task.

The reliability reported for the CARE in community samples refers only to 'pervasive dementia' and not to limited cognitive disturbance (Gurland *et al.* 1982). Henderson *et al.* (1983) have combined parts of both instruments in an attempt to produce an interview for community surveys or general practice research, where case-finding of mild dementia is most likely to be pursued. In a reliability study on 47 geriatric day-patients in Canberra, they obtained a phi coefficient of 0.90 for two psychiatrists rating the cognitive items of the same interview, which was audiotaped; and 0.60 for cognitive items between two interviews averaging 12 days apart. Patients with mild to moderate cognitive impairment comprised over two-thirds of this sample.

For their prospective study of mild dementia, Hughes *et al.* (1982) have designed a systematic interview, the Initial Subject Protocol. This is administered separately to the subject and a collateral source and, together with objective tests of cognitive function, its performance in the detection of mild dementia appears promising.

Valuable data on moderate and severe dementia will be yielded by the very comprehensive Diagnostic Interview Schedule developed by the National Institute of Mental Health (Robins *et al.* 1981) for the investigation of psychiatric disorder in the general population. However, it remains to be seen whether the Mini-Mental State Examination (Folstein *et al.* 1975), which it incorporates for the assessment of cognitive function, is sufficiently discriminating to detect mild cognitive impairment.

Information from only the respondent or patient should be supplemented whenever possible with evidence from an informant. This is of particular value in establishing that a decline in performance has taken place. For obtaining information systematically from an informant a special version of the GMS is available. This was used in the US-UK Diagnostic Project and provides a thorough coverage of symptoms and behaviour, including those features likely to appear in mild dementia (Copeland *et al.* 1976). Enquiry may also be made here about possible aetiological factors such as head injury or alcohol abuse, about performance in daily living, and about the evolution of the cognitive deficit over time.

THE USE OF PSYCHOMETRIC TESTS

We believe that the ascertainment of mild dementia can be made considerably more secure by psychometric tests of cognitive function. In contrast to clinical tests which are essentially qualitative, psychometric tests can yield information about quantitative aspects of task performance, including the subject's level of ability and speed of responding. Many psychometric tests are sensitive to cognitive change and can therefore provide evidence for a decline in performance more readily than a clinical interview. The problem facing investigators in this area is that there is no agreed rationale to guide them in the choice either of cognitive functions or of the tests which assess these. We offer two guiding principles. First, an assessment should be made of those functions which are likely to be impaired early in dementia and also of those which may contribute to a differential diagnosis and therefore to prognosis. Secondly, the psychometric properties of the test instrument should be satisfactory in terms of sensitivity to change, reliability, validity and, of particular importance in this age-group, acceptability. Many cognitive tests are threatening or demeaning to the elderly (Comfort, 1978) or have little relevance to daily living.

Beyond these general principles the initial choice of psychometric tests must be largely arbitrary. The true criterion for a test's success is how well it discriminates in a prospective study. Since we do not know in advance which tests will prove to be successful in the recognition of mild dementia, it is wise to cast the net fairly wide. Clearly, one needs tests of memory, but since some aspects of memory appear to be impaired even among normal elderly people, it is important to include a variety of memory tests. Information processing, including various aspects of attention, categorization and decision-making, should be assessed, as deficits in these areas may underlie memory disorders. Language, spatial functions and reasoning ability should be examined, since they are generally

impaired in moderate or severe dementia and mild impairments may be evident in the early stages of the disease, provided that sufficiently subtle tests are employed. Such tests should derive their inspiration from modern cognitive psychology. Estimates of previous levels of cognitive functions should also be included, although to date only global measures are available, such as the Wechsler Deterioration Index (Wechsler, 1958) and the promising New Adult Reading Test (Nelson & O'Connell, 1978). This test relies on the fact that, in adults, reading ability is highly correlated with intellectual level. Subjects are asked to read aloud a list of words whose pronunciation can be correct only if the reader is familiar with them. Persons with dementia have been shown to be able to pronounce those words with which they were once familiar, though they may not now be able to give their meaning. In this way it becomes possible to distinguish between those with mild dementia and higher levels of previous functioning and those with no dementia but limited premorbid levels of intelligence or education.

Some tests for cognitive impairment are of particular interest. McDonald (1969) claimed that tests of spatial function, attributed to the parietal lobes, discriminate between a relatively benign cognitive impairment and true senile dementia. The group who performed poorly on his tests were significantly younger and had a much higher mortality rate over 6 months. Using the Mini-Mental State Examination (Folstein *et al.* 1975), Folstein & Breitner (1981) have recently shown that SDAT patients who are unable to write a sentence have significantly more affected relatives. The Stroop Test (Stroop, 1935) consists of a list of words printed in different colours. The task is to name the colour of each word. The words are the colour names such as red, green and blue, but they are printed in ink of a conflicting colour. The task can be performed successfully only if the subject pays attention to the colour of the word and avoids being distracted by its meaning. Persons with mild dementia find this difficult. Weingartner *et al.* (1981 *a, b*) have developed word lists where the words are either in semantic categories (e.g. animals or plants) or they are unrelated. Patients with even mild dementia have difficulty in using their knowledge structures, so that, unlike depressed patients, their performance in recalling the words does not benefit from the use of related lists.

Although the psychometric tests which are selected can usually be administered in paper-and-pencil format and the total performance time on each test recorded with a stop-watch, this is an area where microcomputer technology can be a great asset. The parameters of stimulus presentation can be controlled accurately by the computer, thus increasing test reliability; and each response can be individually timed with great precision, thereby increasing the information yield from a given test, which is an important consideration when dealing with a population who fatigue easily. Finally, some recent studies (e.g. Watts *et al.* 1982) show that automated testing is more acceptable to the elderly than conventional paper-and-pencil methods. The refusal rate is lower and subjects report finding the video displays more interesting.

SCREENING ELDERLY POPULATIONS

A case-finding procedure of the type described, involving an interview with the old person, an informant and a number of psychometric tests, may be attempted on some clinical samples but would not be appropriate for large community surveys of the elderly, or for routine use in general practice and hospitals. An efficient screening instrument would therefore be a valuable asset, whether used alone or in a two-phase design as developed for neurosis by Duncan-Jones & Henderson (1978). We note two problems which will have to be overcome. First, the criterion for a screening instrument is a clinical diagnosis of mild dementia which is reliable and valid, ideally based on observations at two points in time; however, a standardized procedure for this has yet to be established. Secondly, a screening instrument is likely to identify a group who have cognitive impairment, but only some of that group will have mild dementia: all that a screening instrument can reasonably be expected to detect is cognitive impairment, of which dementia is only one cause.

For the construction of a screening instrument, we believe that three approaches can be tried. The first is to use a small subset of items from a parent clinical interview, such as the community version of the GMS. The second is to follow the method of Pfeffer *et al.* (1981) who, using a

composite set of psychometric tests taking about 15 minutes, achieved 93% sensitivity and 80% specificity for mild dementia in a referred elderly sample. They used the consensus diagnosis by research neurologists as the criterion. The study sample consisted of normal and mildly demented persons. Anthony *et al.* (1982) have reported 94% sensitivity and 65% specificity of the Mini-Mental State Examination in patients over the age of 60 in a general hospital. A third method, which may prove surprisingly efficient, is to interview only an informant, asking about recent cognitive performance. The informant as a source offers the advantage that his assessment will take into account the target person's educational level; and he can compare past and present performance, allowing a decline from some previous level to be suggested. These different approaches now need to be assessed in community and general practice studies.

CONCLUSION

The ascertainment of cases of mild dementia has become an important research objective. Progress in this field now depends on the development of a common set of criteria, and of a standard method for the early recognition of dementia. If these requirements are not met, the findings in different studies will be hard to interpret. Considerable developmental work is now needed if interviews and psychometric tests are to be constructed to meet this task. Until the results of prospective longitudinal studies are secured, both the criteria and the methods must remain tentative, with their validity still to be established. A separate undertaking is the development of screening methods. These will be necessary so that cases can be economically identified in community samples and general practice for investigation of the natural history of mild dementia, and for research on pharmacological treatment and other factors which may influence outcome. Here is an outstanding opportunity for a major contribution from psychiatric epidemiology to an important global problem.

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