

Impact of cognitive impairment on mild dementia patients and mild cognitive impairment patients and their informants

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ABSTRACT

Background: The aim of this study was to identify key aspects of the impact of cognitive impairment on patients with mild cognitive impairment (MCI) and mild probable Alzheimer disease (AD) and their informants, and identify overlap and differences between the groups.

Methods: Structured focus group discussions were conducted with MCI patients, AD patients, MCI informants, and AD informants. Participants were recruited from memory clinics in the U.K. and the U.S.A. A total of 20 AD and 20 MCI patients and 16 AD and 11 MCI informants participated. Sessions were content reviewed to identify key impacts of cognitive impairment; results were compared across diagnostic groups and for patients and informants.

Results: Seven key themes emerged: uncertainty of diagnosis, skill loss, change in social and family roles, embarrassment and shame, emotionality, insight, and burden. Patients were able to discuss the impact of cognitive impairment on their lives and reported frustration with recognized memory problems, diminished self-confidence, fear of embarrassment, concerns about changing family roles due to cognitive impairment, and anxiety. Informants reported more symptoms and more impairment than did patients and indicated increased dependence on others among patients.

Conclusion: MCI and mild AD exert substantial burden on patients' lives and the lives of those close to them.

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Key words: caregiver burden, patient burden, qualitative analysis, informants for patients

Introduction

Mild cognitive impairment (MCI) is considered prodromal dementia, with as much as 80% of amnesic MCI progressing to Alzheimer's disease (AD) (Petersen, 2004; Petersen *et al.*, 1999). Although MCI is a clinically important syndrome to identify, no consensus definition exists and the relationship between clinical symptoms, everyday functioning and burden on family members is not well understood. By contrast, a substantial body of literature documents the relationship between deficits in patient functioning and the burden of caregivers for individuals diagnosed with probable AD (see Teri, 1997 for a review; see also Bullock, 2004; Gaugler *et al.*, 2003; Gwyther, 1998; Torti *et al.*, 2004; Zarit *et al.*, 1998).

Functional, behavioral and health-related quality-of-life (HRQL) impacts of disorders viewed from the patient's and family member's perspective may clarify this disorder impact. A functional impact refers to aspects of daily functioning (e.g. shopping, using the telephone, managing finances). Behavioral impact refers to observable emotional responses and actions of the patient. HRQL impact refers to the conditions' impact on the patients' experience of their own functioning and well-being.

To develop patient-based outcome measures, patients were recruited to focus groups on the impact of cognitive impairment. This methodology has been used in instrument development in many therapeutic areas (Kitzinger, 1995; Krueger, 1998; Leidy *et al.*, 1999; O'Brien, 1993). The perspective of an informant was also elicited in separate focus groups. The main aim of the study was to identify key themes for MCI and AD patients and informants, identifying overlap and differences. A secondary aim was to create an item pool from the focus group themes, using the patients' own terminology, as a basis for developing a patient-reported outcome instrument for MCI and AD based on accepted standards for instrument development (Streiner and Norman, 1995).

Methods

Four focus groups were formed after written informed consent was obtained: patients with probable MCI, patients with probable mild AD, MCI informants, and AD informants. The protocol was reviewed by appropriate ethical review boards. Each focus group included researcher observers.

Recruitment

Participants were identified and recruited by a neurologist or geriatric psychiatrist through purposive sampling at each of three study centers (two

in the U.S.A. and one in the U.K.). MCI patients were eligible if over 50 years old and met the criteria for MCI (Petersen *et al.*, 2001): memory complaints corroborated by an informant (to clinician, not study staff) but normal general cognitive function; intact routine activities of daily living; and no diagnosis of dementia or depression. AD patients were eligible if they had had a recent (within 3 months) National Institute of Neurological and Communicative Diseases and Stroke/Alzheimer's Disease and Related Disorders Association (NINCDS-ADRDA) diagnosis of clinically mild probable AD. For this study, we recruited patients who were already receiving care for MCI or AD and who had already undergone comprehensive clinical testing, from which the physician had made the diagnosis in advance of recruitment for this study. Informants for patients were family members or close friends who resided with or had frequent contact (minimum four contacts/week) with the patient, in order to collect data on areas of agreement and disparity in the perceived impact of the disease. All informants were spouses or adult children, with the exception of a single non-related caregiver for one AD patient. Patients or informants were excluded if they had severe cognitive impairment, physical impairment and/or history of recent substance abuse or severe psychiatric disorder (e.g. schizophrenia, bipolar disorder) that would preclude group participation.

Twenty MCI patients (two U.S., two U.K. groups) and 20 AD patients (two U.S., one U.K. group) took part. Two MCI informant groups ($n = 11$) and two AD informant groups ($n = 16$) were held in the U.S.A. As a result, informant data were available for 27 of the 40 patient participants. (Patients recruited for the U.K. group had no corresponding informant group.)

Data collection

Three trained facilitators led 90-minute focus groups using a discussion guide developed following a literature review and discussion with clinical experts. The principal investigator (LF) conducted training sessions for all focus group facilitators using the approved discussion guide to maximize consistency of presentation of discussion points and to elicit recommendations for modification of the discussion guide prior to finalization. The guide explored how MCI/AD affected participants' lives, their reaction to symptoms, the experience of diagnosis, the impact on social relationships and family, their ability to complete work or usual activities, and the use of coping strategies. Discussion also focused on patients' specific fears and concerns. The guide for informants explored impact on close friends or relatives. All participants also completed a short demographic questionnaire (Table 1).

Written informed consent was obtained from all participants and focus group protocols and consent forms were approved by appropriate local Institutional or Ethical Review Boards.

Analytical approach

Each focus group was audiotaped and transcribed; four U.S. groups were also videotaped. In addition, researcher observers and focus group facilitators took notes during the sessions to capture important elements. Facilitators and session observer(s) also provided verbal feedback to study staff regarding what they perceived to be the important elements of the focus group. Data sources were reviewed and an interpretive summary created (by LF, LK and AL) (Krueger, 1998; Schattner *et al.*, 1993; Wackerbarth *et al.*, 2002). While qualitative data are not considered generalizable, these participants' accounts illustrate a range of views and experiences. The main aim of the analysis was to organize responses by theme, compare MCI and AD groups, and compare patient with informant groups. A secondary aim was to use terminology and identified themes as the basis for an item pool from which a patient-reported outcome instrument could be constructed.

Results

Sample

Demographic and clinical characteristics of the sample are presented in Tables 1 and 2. U.S. and U.K. samples were similar demographically; results were pooled.

Table 1. Demographic characteristics for MCI and AD patients

CHARACTERISTIC	MCI (<i>n</i> = 20)	AD (<i>n</i> = 20)
Mean age in years (S.D.)	72 (11)	77 (9)
Proportion female (%)	50	45
Living situation, <i>n</i> (%)		
Living alone	5 (25)	3 (15)
Living with someone	15 (75)	16 (80)
Other	0 (0)	1 (5)
Race/ethnicity, <i>n</i> (%)		
Caucasian	17 (85)	20 (100)
African-American	2 (10)	0 (0)
Other (Asian)	1 (5)	0 (0)
Employment status, <i>n</i> (%)		
Employed	5 (25)	1 (5)
Homemaker	1 (5)	4 (20)
Unemployed	1 (5)	0 (0)
Retired	13 (65)	14 (70)
Other	0 (0)	1 (5)
Educational attainment, <i>n</i> (%)		
Elementary/primary school	0 (0)	2 (10.5)
Secondary/high school	7 (36.8)	5 (26.3)
Vocational/technical school	0 (0)	3 (15.8)
University/further education	11 (57.9)	8 (42.1)
Other	1 (5.3)	1 (5.3)

Table 2. Demographic characteristics for MCI and AD informants

CHARACTERISTIC	MCI (<i>n</i> = 11)	AD (<i>n</i> = 16)
Mean age in years (S.D.)	73 (8.5)	71 (12)
Gender		
Male	3 (27.3)	9 (56.3)
Female	8 (72.7)	7 (43.8)
Living situation, <i>n</i> (%)		
Living alone	2 (18.2)	0 (0)
Living with someone	9 (81.8)	16 (100)
Race/Ethnicity, <i>n</i> (%)		
Caucasian	9 (81.8)	16 (100)
African-American	2 (18.2)	0 (0)
Employment status, <i>n</i> (%)		
Employed, full-time	0 (0)	4 (25)
Employed, part-time	2 (18.2)	1 (6.3)
Homemaker	2 (18.2)	0 (0)
Retired	7 (63.6)	10 (62.5)
Other	0 (0)	1 (6.3)
Educational attainment, <i>n</i> (%)		
Secondary/high school	5 (45.5)	3 (18.8)
Vocational/technical school	0 (0)	2 (12.5)
Some college	2 (18.2)	2 (12.5)
College degree	3 (27.3)	2 (12.5)
Postgraduate degree	1 (9.1)	6 (37.5)
Other (nursing school)	0 (0)	1 (6.3)

Males and females were evenly split with the majority living with another. Mean ages were above 70 years old.

Focus groups

Seven key themes emerged beyond the symptom experience: uncertainty of diagnosis, skill loss, social/family roles, embarrassment/shame, emotionality, insight, and burden. The patients' view of self and the informants' view of the patients are expressed in each of these themes below. The informants' own reaction to these themes is grouped under the burden them.

Symptoms

Participants and informants discussed how memory and cognitive symptoms deviated from expectations about normal aging. Patients in both groups reported memory problems such as misplacing objects, word-/name-finding problems, and getting lost. Repetitive speech was also common to both diagnostic groups: "she does like to repeat stories and doesn't realize she's already told them" (MCI informant). Difficulty with name-finding could be severe, even among the MCI patients: "Sometimes I can't immediately get my daughter's name . . . or even my

Table 3. Focus group quotes—common symptoms

I can leave the kitchen, walk into the room that I wanted to go to, and say to myself, what am I doing here? (MCI patient)
Information that I always had remembered in the past suddenly wasn't accessible to me . . . of a sudden I was having to jot everything down (MCI patient)
I forget what I was doing if I leave it for a half an hour . . . then I go back—what was I doing? (AD patient)
Going into a room to do something and forget what I went in there for (AD patient)
I'm forgetting people's last names. (MCI patient)
I used to be quite proud of my vocabulary but now I really find it hard to express myself the way I want to. (MCI patient)

wife” (MCI patient). Patients also reported difficulties with practical number processing, such as counting change in stores, plus a loss of motivation and a tendency to procrastinate (Table 3). Several MCI patients felt this was normal aging.

Uncertainty of diagnosis

There was a degree of confusion around diagnosis in patient and informant groups, but participants accepted they may have forgotten what had been said. Many MCI patients had been told they had “mild memory loss” or “a memory problem that was not too bad,” but most were not given a specific name for their disorder. Attributions varied widely and several MCI patients described concern about developing AD. This uncertainty over diagnosis was corroborated by MCI informants: “not memory . . . it's old age,” and “[it's not] Alzheimer's . . . it's just that . . . the memory isn't there.”

Most AD patients had forgotten the diagnosis and tests they undertook. Very few mentioned the phrase “Alzheimer's disease” or “dementia” and some attributed the start of their problems to specific physical illnesses: “I went down with pneumonia . . . when I came to . . . my memory was even worse than before.” Overall, both groups had difficulty categorizing their symptoms with a stated medical diagnosis.

Skill loss

The MCI patients all recognized that their current level of functioning was significantly worse than before (Table 4). Many patients described frustration at not being able to do things as they used to. Reading, visiting friends (due to fear of getting lost and fear of not following conversations), hobbies, and work activities often suffered. Informants reported that some patients neglected their personal appearance, often wearing dirty clothes and not shaving or washing every day.

Table 4. Focus group quotes—skill loss

It takes me a longer time to read . . . I'm not as interested as I used to be (MCI patient)
I don't bake any more . . . I just kind of lost interest in it. (MCI patient)
[I left work because I was told] it's becoming noticeable that you are forgetting some of the information. And so I felt it was better to exit while I had some credibility. (MCI patient)
I didn't even trust her with the map any more because she'd give me the wrong directions. (MCI informant)

Social/family roles

A common experience was role change within the family. Former responsibilities such as handling finances or being the main driver had now been adopted by spouses or children: "For the last year (my wife's) been handling my check-book . . . I think that lets me down a little bit, to think she has taken over" (MCI patient). Some patients attributed their depression to their changing role in life, commonly within their family.

Embarrassment/shame

MCI patients reported more embarrassment about symptoms than AD, and described more effort in hiding symptoms from others. All patients felt limited in what they could now manage, partly through fear of getting it wrong.

Emotionality

AD informants described paranoia, anger, and depression among the patients. Many mentioned impatience, hostility/anger, anxiety, temper tantrums, increased argumentativeness, obsessional behavior, and loss of emotional control on the part of the patient. Several MCI informants described their concern about changes in normal behavior and the anger displayed by patients, especially in front of children or grandchildren: "He'll go into rages, and he takes it out on me, and he says the same thing over and over again."

Insight

Differences in the level of insight emerged between AD and MCI groups and between patients and informants. Both patient groups showed reduced insight into their intellectual decline and a lack of awareness of changes in their behavior and general mood. Lack of awareness was commonly manifested by lack of treatment-seeking behavior; patients frequently reported they only sought professional help after prompting by relatives.

AD patients were generally poorer reporters of deficits, especially psychological deficits, than MCI patients, describing relatively mild problems

and not mentioning other issues, even when probed. Several denied any problems: “I’ve been basically that way most of my life,” “It doesn’t stop me doing anything.” A few described feelings of mild frustration or anger resulting from their memory problems. By contrast, informants described a range of significant problems among AD patients, such as constant repetition, inability to use the telephone, psychological distress, and fear of leaving the AD patient on his or her own.

MCI and AD patients had a high degree of consistency in both the emotionality presented by their informants and in their lack of awareness of this emotionality.

MCI patients also showed lack of insight into their deficits, though not to the same extent. They described problems with forgetting names, following instructions, getting lost, and understanding conversation, especially jokes, but generally did not report changes in their mood. Some reported they continued pastimes such as playing bridge and cooking. However, their informants described a worse picture and talked of getting lost while driving, leaving the stove on, and forgetting important appointments and obligations. They also reported reduced reading and concentration.

Burden

Both patients and informants expressed concern relating to level of burden. For patients, they feared becoming a burden on family, friends and coworkers. Informants for both groups admitted substantial burden associated with interacting with the patient: “I check up on things she does more than I used to” (MCI informant). Of note was the level of dependence informants reported that MCI patients exhibited and the changing family roles: “He’s becoming much, much more dependent on me” (MCI informant). The informants were now paying bills, driving, and making major purchases on their own. Some informants also described how patients had become clingy: “she really doesn’t want me to go away from the house without her” (MCI informant). All informants expressed their own reaction to the key themes identified (particularly for family roles, emotionality, and insight), which is captured here in the global concept of burden.

Discussion

Strong emergent themes from patient groups were frustration with memory problems, diminished self-confidence, fear of embarrassment, concern regarding changing family roles due to cognitive impairment, and anxiety related to uncertainty of prognosis. The main findings from informant groups

were discrepancies between patient and informant views of symptoms, with informants seeing patients as more impaired than patient self-report indicated, and reporting increased patient dependence on others.

The groups demonstrate that mild AD and even MCI both exert a substantial burden on patients' lives. A broad range of cognitive problems was described, not just memory, which limited patients' role at home and in their social lives. There were also psychological disturbances and changes in behavior that only became apparent through the discussions with informants. MCI patients clearly recognized something was wrong and understood they had memory problems, but not to the extent described by informants. This discrepancy was even more evident in the AD group. AD informants described a more severe disease than the MCI informants, yet several AD patients still felt nothing was wrong with them or this was just a sign of aging. Lack of insight in AD patients is not a new finding, but this gradual change in insight as MCI progresses may prove useful diagnostically.

MCI patients were able to engage in group discussion. They could often recall events and relate anecdotes regarding their illness. They usually recognized their problems and the concerns of their family, yet some admitted to not telling friends or family to avoid embarrassment. Despite this general level of insight, many underestimated their impairments relative to informant report.

AD groups were very different from MCI groups. Discussion was poorer and stories were often disjointed and affected by word-finding problems. Several AD patients expressed concern about the future; others clearly believed there was nothing wrong with them.

These results produce seven themes that provide a view into the earliest stages of cognitive impairment, both from the patients' perspective and from that of early caregiving. They appear to support the perspective that MCI (particularly amnesic) is a measurable early stage on the continuum that concludes with AD. The results identify several domains, including higher-order activities of daily living and behavioral and affective manifestations, which could be used as a basis for describing and measuring milder levels of cognitive impairment than have yet been characterized. Of interest is the finding of notable impairment despite the standard definitions for MCI of intact activity of daily living (ADL) performance; grooming among some MCI patients reflected a decrement from prior (premorbid) standards. This finding is of interest for two reasons. First, patient recruitment was based on physician judgment. It is likely that family members observe a greater extent of ADL skill loss than that observed by a physician. Second, the finding calls into question the validity of an MCI definition in which ADL skill loss is not accounted for. The recent report by Balsis *et al.* (2005) supports the theme observed here, that previously undocumented changes (e.g. personality changes) can be observed prior to

formal AD diagnosis. The personality changes observed years in advance of clinical diagnosis of AD suggest that some AD-related changes may “precede measurable cognitive loss” (p. 100), and add support to the concept of MCI as prodromal AD (Morris *et al.*, 2001).

The differences between informant and patient perspective are of interest both in terms of staging any progression and for designing patient-based measurement. Studies have found high concordance between informant-report and objective dementia measures and generally support the accuracy of informants at moderate to severe levels of AD (Cipolli *et al.*, 1998; Clark and Ewbank, 1996). However, informant accuracy with regard to symptoms at milder levels of cognitive impairment is not known, and although the informant perspective will still be important, valid patient-based assessments may better reflect the true patient perspective. MCI patients themselves generally recognized functional limitations due to their cognitive symptoms, but underrepresented the severity and impact of limitations on others.

Among the domains relevant to measurement are skill loss, changing family/social roles, diagnosis denial, embarrassment, emotionality, insight, and burden. This qualitative work supports the development of measures for both patients and informants to augment assessment of patients as well as characterize the burden of caring for mild to moderately cognitively impaired patients.

Conflict of interest declaration

L. Bowman and J. Flynn work for Eli Lilly and Company, the sponsor of this research, and collaborated in the design. L. Frank, A. Lloyd, L. Kleinman, L. Matza and M. K. Margolis work for The MEDTAP Institute at UBC and worked on this project under contract to Eli Lilly and Company. R. Bullock received financial support for patient recruitment and project consultation from Eli Lilly and Company.

Description of authors' roles

L. Frank assisted with the study design, focus group implementation and data analysis, and is the primary author of this paper. A. Lloyd assisted with focus group facilitation, data analysis and writing the paper. J. Flynn and L. Bowman both assisted with the study design and writing the paper. L. Kleinman assisted with the study design and analysis, and with writing the paper. L. Matza assisted with focus group facilitation and data review. M. K. Margolis assisted with the study design and implementation of the focus groups. R. Bullock assisted with patient recruitment and writing the paper.

Acknowledgments

We thank the following clinical experts for their helpful guidance: Drs Cornelia Beck, Steven DeKosky, Steven Ferris, Zaven Khachaturian, Teresa Radebaugh and Steven Zarit.

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