

Chapter 1 **Diagnosing dementia in general practice**

Mr Tutt was a 74-year-old man who retired after a lifelong successful career marked by his strategic abilities and intellect. Not only was he the former chairman of an international company but in his youth he had won numerous prizes for his poetry and after retirement pursued an equally successful writing career.

Some 18 months before presentation Mr Tutt drove in front of a lorry at a junction. He sustained only minor injuries but his 74-year-old wife was seriously injured. Mr Tutt was cautioned for reckless driving, and became withdrawn, although his optimistic and resilient nature prevented him from becoming depressed. His wife recovered but found it increasingly difficult to manage their busy lives.

The Tutts' professional children became concerned about their father's forgetfulness and their mother's distress and took them to their GP, Dr Smythe, who decided that Mr Tutt was not depressed, but equally wasn't his 'normal self'. In light of this and Mrs Tutt's head injury he referred the couple to an Old Age Psychiatrist.

The consultant saw them together, then separately and also interviewed the children alone. He conducted a full psychiatric history, collateral history, mental state examination, detailed clinical cognitive tests and physical examination with an emphasis on central nervous system (CNS) assessment, a CNS blood screen and MRI brain scan. Mrs Tutt had a personal previous medical and family history of depression, together with recent symptoms of early morning waking, increased tearfulness and ideas that 'life is not worth living'. Her hospital records following the accident showed considerable parietal lobe damage with intracerebral micro-haemorrhage which had resolved, albeit with residual damage, consistent with her head striking the left hand side of the vehicle. Her MRI showed residual scarring and atrophy of the left parietal lobe but with no

other abnormalities, and a clinical picture which did not suggest dementia. Mr Tutt had no signs of depression but struggled with the finer points of biographical detail, for example he was unable to name some of the grandchildren he saw regularly. There were no symptoms of post-traumatic stress disorder. The consultant concluded that Mrs Tutt had a traumatic brain injury late in life, a prolonged adjustment reaction and reactive depression due to a combination of the accident, the changes in their life and the changes in her husband. This was compounded by her vulnerability to depression. She was at risk of Alzheimer's disease purely because of her history of acquired brain injury. In contrast Mr Tutt's mild concerns were more than justified because, although he scored full marks on basic testing due to his intellect, detailed testing showed changes across a wide range of functions in different lobes of his brain. This was particularly the case for recall of newly learned information. His MRI scan showed no ischaemic lesions in the white matter but some early atrophy throughout the cerebral cortex without any lobar emphasis, which with the clinical picture was consistent with Alzheimer's disease with no vascular aetiology.

This case of a married couple of similar age illustrates the difference between a brain injury with a static unchanging clinical picture afterwards, and the insidious creeping nature of dementia, in this case of Alzheimer's disease, which is typically dominated by memory loss and disorientation in the early stages and often later failure to identify familiar faces and places.

Mr and Mrs Tutt were very clear that they wanted to know the diagnoses, and a separate interview with the children confirmed this was the case. The consultant conducted a series of interviews to address the diagnosis. Mr Tutt was started on memantine with a resultant rapid and striking improvement in a range of intellectual skills. His self-confidence improved and he felt his brain was 'working better' again. He continued teaching his 10-year-old grandson about the great poets for a further 18 months during which time he made a graceful exit from his various chairmanships. Mrs Tutt was treated with antidepressants with good effect even though she had been reluctant to take them at first. The couple remained under the care of their GP and the consultant with a view to monitoring any cognitive changes in Mrs Tutt, who also received carer support for her husband's Alzheimer's disease.

How to undertake the assessment for dementia in general practice

The authors recognise that GPs have limited time to assess patients for dementia, particularly as symptoms and signs are not always obvious and

6 How to manage dementia in general practice

may fluctuate between visits to the surgery. The following details outline best practice, and also give GPs the room to bring patients and relatives back to their surgery for further assessment and interviews, in order to build a full picture of the problem.

The right environment

As a first principle it is vital to create the right environment for the initial assessment. However well a GP knows the patient and family it's worth taking the history from the patient and the relatives separately. This is because if Alzheimer's is present, the patient will inevitably, albeit to a variable extent, give incomplete and error-strewn answers. Furthermore, in a joint interview the person giving the collateral history will often leave out important details and events in order to spare their loved one's feelings or out of 'loyalty'. All too often when they are interviewed alone, they will admit a fear of verbal recriminations typified by 'the argument in the car park' should they report things the patient is unaware of. Relatives cite outright anger and hostility, the accusation of exaggerating the problem or 'trying to put me in a home' as reasons for withholding a full history when the patient is present.

The rules governing confidentiality between doctors, patients and relatives are well known and, in principle, permission to release information is required. This permission can be implicit by the patient bringing a spouse with them, or obtained through verbal or more formal written consent. A GP can receive and hold information about a patient in any form without their consent. This is useful when asking for emails and letters relating to the patient, even if the GP is not yet 'allowed' to talk to a spouse or relative. However, if a GP acknowledges that the patient is in their care to a third party, this does breach confidentiality if there is no evidence that this party knew about the GP's involvement.

The history

The history of the presenting complaint from the patient and relative

The aim for the GP in the first instance is to listen to what the patient describes as 'complaints' and establish their order and duration, even if there doesn't appear to be any illness. Commonly the patient will be brought in and declare: '*There's nothing wrong with me*', which makes the collateral history from the spouse very important.

It is important to establish what is meant by 'memory loss' and the exact nature, density and consistency of the memory complaint. Loss of distant memories is more likely in Alzheimer's disease or another profound physical

impairment of brain function. Memory loss in the recent past by which we mean 5 months to 15 years or more is also more indicative of Alzheimer's disease. Newly formed memory loss within 5 minutes to 15 hours is suspicious of Alzheimer's disease but could also be due to depression or poor concentration. Immediate memory loss within 15 seconds is suspicious of depression or poor concentration if in isolation, but may be present in rarer cases of Alzheimer's disease showing a striking impairment of immediate memory. For example a patient's daughter leaves her mother's room in a residential home and the patient turns to the nurse and says, '*Is my daughter ever going to visit?*'

The collateral history

Because of the nature of the disease there are several clues in the history about which the patient may be unaware but which the relative can clearly describe.

The most typical clue is a change in intellectual function which is commonly described as, '*I have to keep repeating myself*', '*He/She doesn't seem to pay attention*', or '*We can't talk anymore*'.

Other symptoms include 'following' behaviour, anxiety about being left alone and the inability to perform tasks which once were easy.

Unusual symptoms may include a flip or inversion of personality, for example when the vicar pinches the bottom of every female nurse, hallucinations or daytime impaired level of consciousness. The latter is different from a nap after lunch from which the patient is difficult to rouse, and indicates rarer dementias.

The previous psychiatric history

Generally this is irrelevant or contains no illness of significance. However, a history of recurrent depression or bipolar disease should raise the suspicion of depressive pseudodementia. Schizophrenia has its own pattern of cognitive deficits that are not progressive or generalised and dementia is not more common in these patients. Past admissions for unsuccessful suicide attempts and alcoholism, with the accompanying risk of brain damage and later dementia, should be taken into account.

Points in the previous medical history

A simple neurological general enquiry into diplopia, paraesthesia, focal weakness, fits, fainting episodes or incontinence may indicate occult intracranial pathology. Past brain injury from trauma, anoxia, prolonged hypoglycaemia or status epilepticus also increases the risk of dementia.

Physical diseases which may mimic or exacerbate dementia include hypothyroidism, pernicious anaemia with missed treatment, poorly managed

8 How to manage dementia in general practice

diabetes mellitus, high blood pressure, ischaemic heart disease, tobacco-related diseases and excess alcohol consumption, either in the past or present.

Significant family history

Dementia does not typically run in families. However any multigenerational history of the disease occurring in up to 50% of family members, which presents under the age of 60, should raise the possibility of familial aetiology.

Sporadic history, as in '*my mother had dementia in her eighties*' is irrelevant to the diagnosis.

However, a family history of dementia-related conditions, such as cardiovascular disease, may be relevant.

Relevant social history

The length of time a patient has lived in their house, the amount of help around and how close their immediate family are, are all of major importance not just in making the diagnosis but also in the prognosis and management. This is particularly true for the first two thirds, or 6–8 years, of the course of the illness. It is worth establishing who does the practical activities including shopping, cooking, laundry, and the bills and, if this used to be the patient, when and why that stopped.

Setting the personal history against the presenting complaint

Understanding the patient's premorbid intellect helps to put symptoms into the context of their ability. Their age at leaving school, academic performance between the ages of 11 and 15 or 18 to include exams such as the school certificate, matriculation, O and A levels and their 'favourite' subjects together with details of their further education are all relevant. A full career history, including national service, part-time work, promotions and awards, also informs the assessment. For women who may not have had the same educational opportunities, a useful assessment includes evidence of management skills in organisations such as the Women's Institute or quasi-professional roles in, for example, the Citizen's Advice Bureau or evidence of mathematical ability with prizes for puzzles.

A professor of engineering who can't do *The Times* crossword as fast as he used to is reporting an objective and subjective but significant finding. In contrast, a patient who struggles to spell a five-letter word in reverse may admit they were '*never any good at spelling*' or '*missed a lot of school*', which can be shorthand for illiteracy and any test should take this into account.

The temporal gradient is a useful tool to investigate likely types of dementia and brain damage from the personal history. This involves looking far back into the patient's personal memory until they remember normally. For example, a patient aged 75 may not remember his final job or the celebration

of a 40th wedding anniversary one decade before the interview, but will remember the places where he played golf on holiday in his fifties or earlier. As the disease progresses the memory deficit reaches further and further back into his longest surviving memories, ultimately destroying recollection of the name of his secondary school or the place where he grew up. The temporal gradient is long and shallow in Alzheimer's disease but it is steep in alcohol-related disease or brain injury.

The examination

Psychiatric examination

While conducting the psychiatric examination it is worth noting that insight is present in early dementia. This becomes eroded to varying degrees in terms of both speech and depth depending on the individual and the disease. Eventually insight is lost, although in some subtypes of frontal lobe disease it may be preserved for a relatively long period.

The psychiatric examination involves assessing the following parameters.

- **Appearance and behaviour:** is the patient dishevelled, unkempt or odorous?
- **Speech:** for loss of fluency or disruptions in grammar which might suggest semantic dementia.
- **Observed mood:** depression can complicate the differential diagnosis. Unusual anger or irritability might raise the possibility of a frontal lobe dementia.
- **Subjective mood:** the patient may not always appear depressed but will describe mood change.
- **Ideation:** secondary delusions often occur with hallucinations and also delusions of misidentification in some demented patients. *'It looks like my house but I know it isn't.'*
- **Perception:** it is worth enquiring about visual hallucinations and to note if the patient looks hallucinated.

Orientation and cognition

Cognitive tests

Cognitive testing can be carried out using a number of methods. The Mini Mental State Examination (MMSE) has moved from solely a research tool via specialist psychiatrist teams to increasing use by GPs. This and other tests are detailed in Box 1.1.

Physical examination

A full physical and neurological examination will exclude any underlying, precipitating or contributory disease and also confirm any suspicions which are raised from the history.

Box 1.1 Cognitive tests

Cognitive testing can be carried out using a number of methods.

- The Abbreviated Mental Test (Hodkinson 1972) is commonly used in general practice and in the wards of general hospitals. It serves well enough as a brief screening test.
- The Mini Mental State Examination (Folstein *et al.* 1975) is still widely used by mental health teams and to some extent by GPs, despite problems with the copyright, which does not sanction such use, unless the papers are bought from the publishers. It is validated for diagnosis but not for serial measurements, so is not ideal for monitoring the progress of patients taking a cholinesterase inhibitor, despite being enshrined in NICE guidance.
- The GPCOG (Brodsky *et al.* 2002) is increasingly used by GPs. It is a rapid and simple screening test for dementia. It is available for use on the Internet at <http://www.gpcog.com.au/>
- The Montreal Cognitive Assessment (MoCA) is a highly sensitive screening instrument for dementia and mild cognitive impairment (MCI) which is increasingly used in general hospitals. Test papers and instructions can be downloaded from <http://www.mocatest.org>
- Verbal fluency tests are a useful rapid assessment tool for frontal executive deficits. They commonly test for fluency in two categories, the phonemic and the semantic. Thus, the patient is asked to produce words beginning with, for example, P (phonemic), or names of animals (semantic), and is scored on the number of items produced in a minute. A person with normal fluency will be able to give some 30 words in three minutes in either category. A score of less than ten words in one minute in each category signals impairment. Phonemic fluency is more sensitive to frontal lobe dysfunction, and semantic fluency to temporal lobe dysfunction, but there is overlap.
- The Addenbrooke's Cognitive Examination, Revised (ACE-R) (Mioshi *et al.* 2006) is a well validated tool for assessing the severity of a dementing illness. It is commonly used by mental health teams, and less commonly by GPs, as it is relatively time consuming.

The investigations

Key basic investigations

Dementia screening includes routine bloods to exclude underlying or co-existing medical conditions which are both more common in this age group but can also aggravate or mimic dementia symptoms. Tests include full blood count (FBC), urea and electrolytes (U&Es), erythrocyte sedimentation rate

(ESR), blood glucose, lipids, liver function tests (LFTs), adjusted calcium, thyroid-stimulating hormone (TSH), B₁₂ and folate. *Treponema pallidum* haemagglutination (TPHA) may be worth doing to check for syphilis.

Special investigations

Both magnetic resonance imaging (MRI) and computed tomography (CT) brain scans will not only help to exclude space-occupying lesion and normal pressure hydrocephalus but will also demonstrate the presence of lobar or generalised atrophy.

MRI scan has a higher resolution than CT scan and can better demonstrate white matter micro-vascular infarcts which are associated with dementia. However 30–50% of patients with dementia may have a normal MRI scan while 30% of normal people over the age of 65 have deep white matter lesions.

Bilateral atrophy of the medial temporal lobe is strongly suggestive but not diagnostic of Alzheimer's disease.

There are only two instances where a high level of sensitivity and specificity has been achieved on testing. This is in extremely rare family pedigrees, numbering only 60 to 100 families of early-onset disease where serial MRI scanning can demonstrate early onset in individuals. The other is a special angled CT scan of the hippocampus coupled with cerebrospinal fluid (CSF) amyloid and tau levels. These investigations are typically carried out in specialist centres, such as the Institute of Neurology, London, and GPs will be well advised to ensure their patients avoid commercial screening services.

Typical presentations of dementia in general practice

Dementia presents in a host of different ways to GPs. As already described, the most typical presentation is a patient or relative complaining about a 'failing' memory. Rarely patients will bring themselves to the surgery but far more often a concerned relative or friend will take them to the GP.

Should a patient present alone, they will typically say, *'I don't know why I'm here doctor, there's nothing wrong with me, but my husband or wife or daughter said I should come and see you.'* Complaints such as, *'I get to the top of the stairs and then cannot remember what I went up for,'* or, *'He empties the dishwasher but puts the cutlery in the saucepan drawer,'* while seeming innocuous or even understandable considering the age of the individual, must be taken seriously. Whenever a patient or relative complains of memory loss they are right.

12 How to manage dementia in general practice

Box 1.2 Common presenting complaints in dementia

- **Temporal gradient pattern of memory loss.** This is faulty memory for personal events over preceding 10–20 years. A 75-year-old forgets their job before retirement, or their grandchildren, rather than events from 50 years before. Example: *'He forgot our daughter has two children, he remembers the older one aged 11 but has forgotten the 4-year-old.'*
- **Difficulty recalling newly learnt information** which is registered but forgotten within a few minutes. For example a spouse will complain: *'I told him six times he had a doctor's appointment this morning.'*
- **Agnosia:** a perceptual failure of recognition, which includes:
 - topographical agnosia; getting lost in familiar places. Patients will say: *'I knew I should know which way to drive to go down the High Street doctor, I've been there a thousand times, it's stupid but I couldn't think whether to turn left or right'*;
 - prosopagnosia, also known as face blindness, which typically manifests with longstanding acquaintances rather than friends or family, for example, *'I know I should know who that man is coming towards us but what's his name dear?'*;
 - Capgras syndrome is the failure to identify a familiar person. Example: *'He looks like my husband but I know he isn't, he's an impostor'*. This extends to buildings, for example, *'My mother goes out shopping but won't go through the front door and says it is not her house'*;
 - a rare but interesting complaint is called delusional self-misidentification: also known as the mirror sign, this is the inability to recognise one's own face in the mirror or a photograph.
- **Dyspraxias:** difficulty with conceptual understanding of physical attributes for everyday objects and their uses. Example: *'She doesn't seem to know how to use the TV remote control anymore'*, *'She has to use a recipe and weigh everything'*, *'He doesn't seem to know where to put the things when he's doing the drying up. I just tell him to put them all on the table'*, *'I found the camera neatly hidden between the towels at the back of the airing cupboard.'*
 - Constructional dyspraxia is a disturbance in understanding of drawn or constructed two- or three-dimensional objects. GPs can test this by asking the patient to copy a complex figure, or complete a clock face drawing.
 - Visuospatial dyspraxia is disturbance of dimensions of space and solid objects. Example: *'He tried to walk between the fence and the oak tree on the front lawn but there's only a four inch gap there. He thought he could get through.'*

- **Loss of fluency of thought** together with comprehension for the spoken and ultimately, written word. For example, a patient will complain that: *'I try to avoid party conversations now as I find it difficult to follow. By the time I say something the conversation has moved on.'*
- **Apathy** in the absence of depression or physical disorder. Example: *'He doesn't seem to do anything, he just sits there on the settee staring into space. He never used to be like that but doesn't seem to mind. I do.'*

The four main types of dementia

At a general level, dementia can be defined as an inexorable, typically global progressive disease of the brain which eventually results in significant destruction of tissue, usually throughout the organ but sometimes restricted to a unilateral or bilateral single region or lobe, which ultimately results in death.

However dementia can also be described as an aberration of one specific area of the brain which undergoes a spreading pathology. This global spread and destruction of tissue may become universal, as in the case of Alzheimer's disease, where medial temporal lobe and hippocampal atrophy occur first. Alzheimer's disease and mild cognitive impairment share this pathology in the hippocampus. Opinions vary on whether, in mild cognitive impairment, the histopathological and functional changes stay restricted to this area and are non-progressive. Usually spreading pathology in all dementias will eventually involve multiple neocortical and subcortical regions to a greater or lesser extent. In some cases this will penetrate the cerebellum and brainstem.

Patients, families, the press and some doctors refer to dementia as 'Alzheimer's disease' or 'vascular dementia'. In a nutshell, these and many other aetiologies probably overlap and together represent the discernible multiple facets of a poorly understood overarching condition or conditions, which is best described clinically by the umbrella term 'dementia'.

At a clinical level, the most useful difference for GPs is not whether the patient has Alzheimer's disease or vascular dementia, but rather, whether they have one of these two conditions or the very different fronto-temporal lobe dementia and dementia with Lewy bodies. Longstanding Parkinson's disease may have its own obvious and related dementia. Other types of dementia are rare.

Some 40% of dementia patients in Europe and the USA have an Alzheimer's disease pattern and pathology, while 40% display mixed symptoms and pathology of Alzheimer's disease and white matter cerebrovascular disease. The latter group will not show large lacunar infarcts or intracerebral haemorrhage on brain scan. A further 15% have dementia with Lewy bodies

14 How to manage dementia in general practice

or more rarely Parkinson's disease dementia. The remaining 5% include 'all other' causes.

Alzheimer's disease

This is a slow dementia of 12–14 years' duration in which short-term memory impairment and time, place and person disorientation typically present early but insidiously spread to involve all brain functions.

As described previously, the cognitive symptoms occur early and usually include memory impairment. Initially there is a failure in storage of new items, so-called 'recent' memory. With disease progression there arises difficulty in retrieval of already stored memory, so-called recent and distant memory. A shallow temporal gradient loss with proximity and time to the onset of dementia is typical of Alzheimer's disease, as opposed to memory loss from head injury or alcohol abuse, with its steep temporal gradient.

The significance of digit span

Digit span, that is the ability to remember seven or more letters forward and five in reverse, is impaired in mid- to late-stage Alzheimer's disease and other dementias. In contrast it is relatively preserved in Korsakoff's psychosis. It is often error strewn in hysterical amnesia, for example when a patient walks into the surgery and says '*I can't remember my name.*'

False memories, the veracity of which the patient is convinced, and more unusually, frank confabulation may eventually occur, in Korsakoff's psychosis.

Speech and language symptoms

Speech and language are significantly affected as the disease progresses, early signs usually include anomia or 'nominal aphasia': the inability to name objects. This is at first only for infrequently used items but ultimately both high and low frequency used nouns are lost. Verbal ability may deteriorate further with the perseveration of words or sentences inappropriately from one answer to the next. For example: '*What month is it?*' 'March.' '*What day of the week is it?*' 'March.' Expressive and or receptive aphasia can occur but is more typical of cerebrovascular disease.

Impairment of comprehension of others' speech is common by late-stage disease. Finally echolalia (echoing another's word) or palilalia or mutism (inability to speak) may interfere with all speech.

Agnosias, that is the failure of recognition, and dyspraxias, failure to perform fine motor tasks, despite intact perceptual and motor function, grow more frequent with the passage of time in this disease. Topographical agnosia, or the inability to find the way, is frequently affected.

On a practical note, carers frequently complain of patients losing ability to use household appliances such as the cooker or TV, or using them inappropriately such as putting an electric kettle on a gas hob, or becoming unable to use household utensils or passing urine or faeces in the waste paper bin. A frequent precursor of failure of home care is the inability to recognise familiar faces such as a spouse. This so-called prosopagnosia makes it difficult for the carer to maintain a close emotional bond with the sufferer.

Insight is usually present in the early stages but often becomes quickly limited, not least by patients forgetting they have a memory problem. In the early stages denial may also hinder insight in susceptible individuals. In the authors' experience and as illustrated in Mr Tutt's case history, the patient's emotional reaction to the diagnosis is often disproportionately stunted compared to that of their spouse or carer.

In the final quartile the encroaching damage to motor functions, including respiratory and swallowing ability, and the resultant bronchopneumonia ends in death. Neither clinical, nor imaging or biomarker tests reliably distinguish Alzheimer's in life, but the hallmarks of microscopic brain changes are well described. These show on postmortem examination (Box 1.3).

Box 1.3 Microscopic brain changes in Alzheimer's at postmortem examination

- Amyloid protein plaque deposition in the interstitial structure.
- Misformed or 'dystrophic' brain neurones packed with abnormally processed tau protein.
- Gross loss of both specific localised neurotransmitter pathways and the global generic cortical pyramidal neurones and cortico-cortical neurones that make up the majority of the brain.

Box 1.4 Neuroimaging changes in Alzheimer's

The clinical progression of Alzheimer's disease is mirrored by positron emission tomography (PET) scanning which shows the start of the disease in the hippocampus, which is the headquarters of memory, emotion and pain integration in the brain. PET scanning shows this is followed by amyloid seeding over the front half of the brain at first which spreads backwards. In contrast, the so-called tau tangles appear first in the parietal and temporal lobes and spread from these. Eventually the effects are seen over the entire brain and nerve cells die at a rate of 3–4% per year.

Vascular dementia

Pure vascular dementia is rare. Like any other dementia it is progressive and ultimately global in its deterioration. Its various forms have been defined mainly by brain scan and are largely only of use for research purposes.

GPs see far more patients with stroke than with vascular dementia, but many of these patients will be concerned about developing Alzheimer's simply because their brains are not working as they once did. Although there is a relationship between cerebrovascular disease and dementia in some patients, it is impossible to link the extent of a stroke with the likelihood of developing progressive brain disease.

An obvious index event, such as a recoverable cortical or brainstem stroke, can also herald the early stages of the condition to both patients and their clinician. However, more typically patients will either have been unaware of the existence of past strokes for many years, or they will have apparently recovered fully from them.

Mr Morris was an 80-year-old former senior naval officer who had retired in his 50s but continued to sail competitively for fun, and was captain of his local sailing club. Post retirement he also remained actively employed managing a property portfolio.

One New Year's Eve, Mr Morris turned to his wife and asked if they should send their Christmas cards soon? She was taken aback, and realised that he could not remember anything of the large family gathering they had just had, nor vast swathes of memory for the preceding 3 weeks.

Mrs Morris immediately took her husband to their GP, Dr Abel. Dr Abel suspected an acute event and referred Mr Morris to a neurologist, but by the time of the appointment most of his recall had returned and a diagnosis of transient global amnesia of vascular origin was made. The MRI scan showed no discrete lesion but moderate white matter damage with no treatable cause.

Several months later Mr Morris returned to Dr Abel with careful notes about his symptoms, and asked: 'Am I getting dementia, doctor, as my mind doesn't seem to work as fast as it used to?' Dr Abel was unable to find any defects on cognitive testing but in light of Mr Morris's clarity about his complaint referred him to a consultant Old Age Psychiatrist.

The specialist, together with a professor in clinical psychology, conducted full psychometric tests which revealed little other than anxiety at this stage. However they asked to review Mr Morris over the coming months.

During this period he became increasingly irritable and preoccupied and was prescribed a selective serotonin re-uptake inhibitor (SSRI) to treat atypical depression, which produced significant improvement in his mood, irritability and sense of distress about his reported shortcoming.

Over the next 3 years Mr Morris continued to report the shortcomings in his ability, he continued to be assessed by his GP and specialists but showed no signs of deterioration.

After 2 years the SSRIs were stopped, but symptoms returned within a year, this time with mild alterations in cognitive function. Both were immediately restored by restarting the antidepressants.

By year five Mr Morris' careful notes about his complaints were exactly the same as at his first presentation, although he felt there had been an insidious and consistent deterioration.

However, Mrs Morris, their daughter and GP agreed he had become less flexible, astute and confident in dealing with his financial affairs. At the same time his cognitive tests dropped below their usual maximum possible scores in some areas. One particular test into 'executive' function fell by 10% but still remained twice the national average.

Scans continued to show moderate white matter damage.

In light of the step down in ability, the possibility of a progressive illness was acknowledged and Mr Morris was started on a trial of an anticholinesterase. Within weeks he returned to his previous high scores of maximum function on cognitive testing but continued to feel he had lost some ability.

Eighteen months later, Mr Morris threw a table lamp towards his young grandchild. This uncharacteristic behaviour marked another step reduction in function.

This case illustrates some of the most typical features of vascular dementia: a sudden onset of cognitive decline over a period of days or weeks followed by several plateaux of extended stable function from weeks to years, typically interspersed with sudden step-like periods of deterioration. This is set against background evidence of cerebrovascular pathology, in this case of white matter change.

Step-like deterioration

Step-like deterioration is one of the most interesting features in this disease. A deterioration or 'step' is typically described by a patient as:

- a difficult to understand sense of malaise;
- a brief self-limiting loss of functions of the brain region most affected, such as a transient ischaemic attack involving the middle cerebral artery territory in the motor cortex; or
- occasionally the total loss of recall for a swathe of memory most likely to be of recent origin in a transient global amnesia.

Relatives will typically describe the following:

18 How to manage dementia in general practice

- ‘They’re much worse’;
- ‘He’s been confused since last Monday’;
- ‘Last week she suddenly started going down the drive, shouting at a tree. She said she could see an Alsatian in it. She’s not doing it now, but she’s not herself’.

This step reduction in performance typically takes a matter of minutes or hours, reaches its nadir and then slowly begins to recover over a period of days or weeks. After a further few weeks, the relative may say that there has been some improvement but will nearly always describe a slight downward shift in overall function, even though the acute crisis is fully resolved and the current clinical picture is stable.

GPs will often see similar patterns of deterioration with limited recovery after a range of illnesses from infections to inflammation in their elderly patients. The underlying cause of this irreversible decline in cognitive abilities is unknown but is clearly not solely due to a single ischaemic or microhaemorrhagic brain event.

TIA may be an important marker for future dementia

Transient ischaemic attack (TIA) is defined as acute stroke-like neurological impairment that lasts for a few hours and which, by definition results in no permanent damage to brain tissue. Having said that, a TIA can be followed by an actual stroke, particularly in the first 48 hours. Doctors often make the diagnosis based only on the acute neurological symptoms, such as paralysis of one side, or of part of a limb or anaesthesia, paraesthesia, loss of sight, or dysphasia. However it is worth noting that patients with vascular dementia are often left with a much longer-lasting or permanent deterioration in memory and drive after a so-called TIA. A stroke can affect any part of the brain, including the non-motor and non-sensory areas of the temporal and frontal lobes. The permanent deficit in the domains of memory and frontal lobe function may not be so easy to detect as the standard neurological signs, and will therefore remain unreported if not actively sought. Furthermore if they are detected in patients who already have a diagnosis of vascular or other dementing illness, this new sign may be ignored and presumed to have been present all along. This error can be avoided by taking a collateral history from family or friends and referring to a previous Mini Mental State Examination scores. In these cases a score from two months earlier of 21/30 will typically drop to a lower figure such as 15/30, only to recover to near its previous level. However, when the acute brain insult has recovered as far as possible and the penumbra of damaged but not dead neurones has regained function, perhaps over a period of weeks and months, the patient will be left with a lasting defect. This is due to the permanent loss of function of the

neurones at the centre of the infarct. Further recovery for up to 6 months or so occurs only if undamaged portions of the brain assume the functions of the permanently damaged part.

Dementia with Lewy bodies and Parkinson's disease dementia

Dr Jones looked after 83-year-old Mrs Hewitt until she died from pneumonia but knew her 86-year-old husband would find life difficult because they had been inseparable since they met in their early twenties. He was called by the manager of the residential home soon after the funeral because Mr Hewitt insisted his wife was in the cellar and that he had seen her in the corridors. At the same time he agreed that it couldn't be her because he knew she was dead. He also complained about spots on the kitchen counter which the care manager could not see. After checking for physical illness, Dr Jones decided Mr Hewitt was grief stricken. He prescribed benzodiazepines and was considering grief counselling, but Mr Hewitt's distress worsened so he requested an opinion from the Old Age Psychiatrist.

After excluding underlying causes, the specialist who was struck by the intensity of the grief, the endless searching for a lost partner and the pseudo-hallucinations concluded that Mr Hewitt had a pathological grief reaction together with paranoid ideas, although they did not completely meet the criteria for delusions.

He began a 6-month period of grief counselling during which Mr Hewitt talked intensely about every aspect of his relationship with his wife. At the same time a very low dose of the atypical antipsychotic drug quetiapine was prescribed to temper the paranoia. After 2 months, Mr Hewitt started crying in his session but said he felt much better and that everything made sense and he could see that he'd imagined his wife was downstairs. Although he could still see the spots in the kitchen he stopped worrying about how they got there.

Over the next 6 months the antipsychotic was tailed off, and throughout this period his cognitive scores remained intact.

Two years later Dr Jones was called again because Mr Hewitt had been found wandering and confused in the town at 2 am without any shoes. An underlying urinary tract infection (UTI) was diagnosed and treated with good result.

Six months later after Dr Jones was called again because Mr Hewitt could see lights moving around in his flat; he referred him back to the Old Age Psychiatrist.

This time cognitive testing was abnormal and a provisional diagnosis of dementia with Lewy bodies was made. Mr Hewitt was started on galantamine but developed diarrhoea so was switched to donepezil. This restored Mr Hewitt's cognitive function but did not alter his visual hallucinations.

20 How to manage dementia in general practice

Two years later the psychiatrist was conducting a 6-month follow up when the live-in carer reported a fall when Mr Hewitt looked up to shut his curtains. Given the parkinsonian nature of this fall, namely the vertical Romberg's sign or inability to recover balance when leaning backwards, he conducted a full examination which revealed mild cogwheel rigidity and positive glabellar tap. A diagnosis of dementia with Lewy bodies was confirmed, with the onset of parkinsonism after 2 years.

Dr Jones and the specialist agreed to a trial of low-dose Sinemet which returned Mr Hewitt to full mobility together with an increase in confidence without worsening hallucinations. Symptoms of rapid eye movement (REM) sleep disorder including vivid dreams and disturbed nights settled with a hypnotic.

Eight years later Mr Hewitt continued to enjoy a high quality of life at home with a live-in carer, under the supervision of his GP and Old Age Psychiatrist.

Currently the majority of patients GPs see with dementia will have Alzheimer's disease or a mixed aetiology vascular dementia. However there is a significant minority of patients who will have Lewy body disease. This represents a spectrum of disorders of uncertain aetiology but which is identified by regional or generalised brain Lewy bodies at postmortem. The relevant ones for GPs are dementia with Lewy bodies (DLB), with a 1% total prevalence over the age of 65, and Parkinson's disease dementia (PDD) with a 0.5% total prevalence over the same age.

As is illustrated by the case above, the features of dementia with Lewy bodies are:

- fluctuating cognitive impairment which becomes consistent;
- visual hallucinosis often with secondary paranoid delusions;
- variable fluctuations in conscious level during the daytime which presents with a carer complaining that the patient is difficult to rouse;
- memory problems which are less evident at the start of the illness than in Alzheimer's disease;
- 50% of cases will have minor symptoms of parkinsonism at presentation, but nearly all go on to develop extrapyramidal symptoms, the commonest being bradykinesia and stiffness;
- there is increasing evidence of a link between REM sleep behaviour disorder, the acting out of dreams often with violent results, and dementia with Lewy bodies;
- increased sensitivity to the adverse effects of neuroleptic antipsychotic drugs which far exceeds that seen in other dementias – they will exhibit extreme parkinsonian side effects together with dramatic confusion and general deterioration to the point of near-absolute contra-indication of this drug group.

Parkinson's disease dementia

Parkinson's disease dementia occurs at least 1 year after presentation with one of the typical Parkinson's disease motor syndromes. In reality only 50% of patients will have dementia after one decade and 83% after two. Apart from this timing difference, once it emerges, the features of both dementias are broadly similar.

Fronto-temporal lobe dementia (FTLD)

Mr Jones was a 65-year-old previously fit and active self-employed engineer who was taken to his GP, Dr George, by his wife who complained that he 'wasn't himself'. Mrs Jones said that her husband seemed to 'lack purpose and initiative', which was out of character for him. Two months previously in an 'odd' incident he had fallen and knocked himself out on the pavement after his usual two glasses of rosé in the pub. He thought he had tripped on a badly maintained paving stone. He was admitted to hospital for investigations including a CT brain scan, which revealed no abnormalities, and was discharged after 24 hours.

Dr George knew Mr Jones well and had successfully treated him for one episode of depression 5 years previously. A detailed history and examination including an assessment using Beck's depression scale, found a score of 18/63 indicating mild depression. Dr George prescribed escitalopram, but because Mrs Jones was very clear that this episode was 'different' from last time he also referred him to a psychiatrist. This specialist thought there was an organic flavour to the symptoms and requested a further review by an Old Age Psychiatrist.

On more subtle questioning this specialist found Mr Jones displayed 'inappropriate schoolboy humour' which was inconsistent with his premorbid personality. His time orientation and short-term memory were scarcely impaired but were not perfect, scoring 27/30 on Mini Mental State. He also had a surprising amount of retrograde and anterograde amnesia from his head injury despite the lack of any obvious significant brain damage.

There was no consistent evidence of depression although Mr Jones was demoralised that he had wound up his lucrative and demanding small engineering firm 6 months before. He described drinking three bottles of whisky a week after work with his two close partners in his forties and fifties, but never experienced withdrawal or dependence. His wife confirmed he drank little more than one or two glasses of wine a day for the previous 15 years.

All other detailed clinical cognitive tests of lobar function fell within the normal or above average range. Physical examination and central nervous system (CNS) blood screen revealed no signs of alcohol abuse or liver disease.

22 How to manage dementia in general practice

CNS examination was normal, including the absence of any frontal signs. A subsequent MRI brain scan showed mild bilateral cortical atrophy involving the frontal and anterior temporal lobes with little else except very mild deep white matter cerebrovascular hyperintensities, consistent with a man of his age.

A diagnosis of likely fronto-temporal lobe dementia was made, Mr Jones was commenced on a cautious trial of low-dose donepezil in addition to the antidepressant and referred to a teaching hospital neurology centre. Whilst awaiting that appointment, Mr Jones went to Dr George complaining of difficulty swallowing and speaking.

An urgent barium swallow was done to exclude a physical obstruction. The Old Age Psychiatrist also reviewed him urgently and found he lacked concern about his symptoms. The muscles of his left thenar eminence twitched while his hand rested on the desk and his wife confirmed this had been affecting him for a few days and had put it down to nervousness. This time full physical examination showed widespread fasciculation of the large and small voluntary muscle groups across the torso and limbs with clonus and increased spinal reflexes in the lower limbs. An urgent consultant neurologist review confirmed this and noted likely early muscle wasting of the deltoids and quadriceps. Electromyographic (EMG) testing of muscle and spinal nerve function showed typical changes of amyotrophic lateral sclerosis. A provisional diagnosis of motor neurone disease complicating fronto-temporal lobe dementia was made and Mr Jones was referred to a national centre.

This case illustrates some of the key findings in fronto-temporal lobe dementia, which typically occurs in younger adults, ranging from 45 to their mid 60s. As the name suggests the condition affects only the frontal lobes or temporal lobes either unilaterally or bilaterally, even into the terminal stages of the condition.

It is an aggressive and rapidly developing dementia, destroying 6% of brain tissue per year compared to 3% in Alzheimer's disease.

The variants include:

- frontal type, which is typified by loss of judgement and defects in reasoning;
- semantic type, with loss of language skills. This group includes Pick's disease.

Unlike in Alzheimer's disease, patients will show considerable preservation of orientation, memory, and the ability to understand words and use objects in the world around them late into the disease. However they do demonstrate marked behaviour, personality change or exaggeration, disinhibition, apathy, speech impairment and stereotypic movements such as pursing the lips to

Box 1.5 Features of fronto-temporal lobe dementia

In the early stages the patients may exhibit a variety of symptoms:

- disinhibition: to include offensive language and/or offensive attitudes;
- lack of judgement in social situations which can include a lack of their usual sympathy or care for other people's feelings; at work they may make unwise or overconfident decisions or overreach in their business in financial matters;
- apathy and lack of motivation which can be prominent early signs which may lead to the misdiagnosis of depression.

sip an invisible cup and sometimes parkinsonism, usually with an abnormal electroencephalogram.

Some 10% of all fronto-temporal lobe dementias are marked by the emergence of motor neurone disease.

Early diagnosis is vital

Early diagnosis is vital as the social consequences of this disease can be devastating. Patients at this age will be working or have dependent children and be expected to behave like healthy and responsible adults in a range of social situations. As the condition and their behaviour worsens, they will be subject to increasing difficulties. They may be repeatedly reprimanded at work, eventually losing their jobs, or if they own a business will find both staff and customers questioning their actions and drifting away.

Early diagnosis will not only help to mitigate the inevitable emotional stresses at home and at work and but can also make a financial difference. This is because once family, friends and employers understand the reasons for the patient's behaviour they are less likely to treat them punitively. Furthermore, although employers may still find inappropriate behaviour and poor performance unacceptable, they may be more sympathetic and provide a softer landing and gentler options. For example the patient may be retired on medical grounds with its associated benefits rather than undergoing a harsh disciplinary procedure resulting in summary dismissal.

Families and employers who are prepared may be able to avoid any social, financial or legal consequences of a patient's inappropriate actions as a result from their illness.

Overall, early diagnosis gives everyone involved more time to prepare in physical, financial, structural and emotional terms for the future.

Key points

- Dementia is inexorable progressive brain disease resulting in loss of up to 50% of brain tissue.
- A patient complaining of memory loss, however elderly, is probably right.
- Obtaining a collateral history from a reliable source is vital.
- The Temporal Gradient, Specific Naming, FAS, and GPCOG are useful cognitive tests for GPs,
- Patients with dementia can have normal MRI scans.
- Alzheimer's disease and vascular dementia should be differentiated from Lewy body and fronto-temporal lobe dementia.
- Step-like deterioration is a key feature of vascular dementia.
- 10% of patients with fronto-temporal lobe dementia will develop motor neurone disease.
- Parkinson's disease dementia occurs at least 1 year after presentation with parkinsonian symptoms.
- Early diagnosis of fronto-temporal lobe dementia can make a financial, legal and emotional difference to patients and their families.

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