Physical Comorbidities of Dementia

Henry Brodaty & Susan Kurrle

Definition of holistic (adjective)

Pronunciation: /həʊˈlɪstɪk, hɒ-/ chiefly Philosophy characterised by belief that the parts of something are intimately inter-connected and explicable only by reference to the whole

Medicine characterised by treatment of whole person, taking into account mental and social factors, rather than just symptoms of a disease

“Lately, I’ve been feeling lethargic, listless and apathetic, and if stand up too quickly, I get dizzy.”
“My daughter says she has to smoke two joints to feel like that”

“Autumn Years Dating Agency

“It says here that you’d prefer someone with regular bowel movements.....”

“It says here that you’d prefer someone with regular bowel movements..... Does it matter if they are involuntary?”
**MRS K**
- 74 year old lady, lives with husband in own home in suburban Sydney
- 7 year history of Alzheimer’s disease, on donepezil, now significantly cognitively impaired, requiring prompting or assistance with most ADLs
- 4 years ago experienced visual problems with difficulty seeing and negotiating steps, resulting in occasional trips or falls, and often unable to locate knife and fork on table when eating
- 3 years ago began to lose weight despite eating well, and has lost approx 7 Kg

**Mrs K**
- 1 year ago developed urinary incontinence – uses pads, regular toileting by husband
- 8 months ago developed episodes where right leg twitched then gave way leading to falls, followed by short period of confusion
- 2 months ago, had fall resulting in hip fracture with subsequent hemiarthroplasty → high care

**Physical comorbidities of dementia**
- Comorbidity: condition or disease that coexists with another disease, and has a probable pathological link to that disease, and occurs more often in that disease
- A number of conditions occur more commonly in people with dementia than in the older population without dementia
- Lot of emphasis on cognitive symptoms and on BPSD, but little knowledge of physical conditions (comorbidities) seen more often in people with dementia
Professor Sue Kurrle

www.cambridge.org/9781107648265

Physical Comorbidities of Dementia

- Literature review over 3800 articles
- Selected comorbidities for review:
  - falls
  - epilepsy
  - delirium
  - frailty
  - malnutrition
  - gum disease/dental disease
  - visual impairment
  - sleep disorders
  - Incontinence
- Did not review pain, BPSD

Falls in dementia

- Annual incidence of falls in cognitively impaired populations is 70-80%, double rest of population
- Fractures are up to 3x commoner in people with dementia
- Hip fracture is 3x commoner and ...
- People with dementia are 3x more likely to die in the first 6 months
Falls in dementia

- Gait abnormalities are more common in people with dementia especially Vascular Dementia (VaD), Dementia with Lewy Bodies (DLB), Parkinson’s Disease Dementia (PDD)
- Psychotropic drug use is more common in people with dementia, leading to falls
- Orthostatic hypotension is more common in dementia particularly DLB and PDD
- Postural instability more common in dementia

Why do people with dementia fall?

- Impaired executive function and motor planning skills
- Unrealistic perception of motor abilities
- Reduced attention span
- Impaired visuospatial skills
- Impulsivity
- Risk taking behaviour

Management of falls risk

- No interventions proven to prevent falls specifically in people with dementia
- Multifactorial interventions in residential care may help – hip protectors, soft surfaces, lighting, shoes
- Restraints are very likely to worsen falls
- No evidence to screen people with dementia for falls risk but sensible to intervene opportunistically to modify risk
Recommendations

- Review medications
- Decrease psychotropic meds if appropriate
- Assess and treat orthostatic hypotension
- Treat cataracts
- Simple strength & balance training exercises
- Environmental modifications
- Fall alarms, hip protectors, helmets
- Consider Vitamin D and calcium supplements, and bisphosphonates if low BMD or previous fracture

Supportive shoes .... avoid scatter rugs

Vitamin D

- Synthesise vitamin D in skin
- Convert to 25-OH D in liver
- Convert to 1-25 di-OH D in kidney
- Daily intake – 1,000iu/day
- Aim for Vit D level >50nmol/L
- Consider liquid form especially if very low vitamin D levels

Neurocognitive performance
Nervous tissue
Cardiac benefits
Protective against malignancy
Bone health
Muscle function
Prevents falls
**Epilepsy**
- Seizures: brief, unprovoked disturbances of consciousness, behaviour, motor function, sensation
- Seizures not mentioned by Alzheimer originally, but are in diagnostic criteria for AD
- Between 5% and 10% of people with dementia are reported to suffer from a seizure during the course of the disease
- Down Syndrome:
  - DS with AD – 50% had seizures
  - DS with no AD – 11% had seizures

**Epilepsy**
- Increased risk for unprovoked seizures in AD vs control group:
  - 87 fold increased risk for 50-59 yo
  - 3 fold increased risk for 85+ yo
- 6 fold increase in dementia vs normal older population

**Recommendations**
- Be aware that seizures occur more commonly in patients with dementia
- Be aware that seizures may be atypical
- EEG may not be conclusive
- ChE1 may increase chance of seizures (but no trial evidence for this)
- Consider treatment with anticonvulsants:
  - valproate, carbamazepine
Malnutrition and weight loss

- Described by Alzheimer in patient JF
- AD patients likely to lose on average >5kg during course of disease
- Appears to be dysregulation of energy balance with most patients likely to lose up to 10% of body weight
- (some gain up to 5% of body wt)
- People w. VaD & FTD also lose weight

Malnutrition and weight loss

- In several cohort studies (> 25 years follow up)
  - significant association between weight loss and subsequent development of AD
  - ? relationship to causative pathology with link between medial temporal cortex atrophy and decreased BMI
- Dementia increases risk of malnutrition in Finnish NH study
  - OR 2.1 (1.45 – 2.93) for malnutrition in patients with vs patients without dementia

Recommendations

- Identify dementia patients at risk of weight loss and protein energy malnutrition, and treat to prevent:
  - Loss of muscle mass and strength
  - Pressure ulcers
  - Loss of immunity and increased infection rate
Recommendations

• Intervene where weight loss of >5% in preceding 3-6 months
• Education of family and professional carers in nutrition is effective
• Enteral feeding in late stage dementia is unlikely to be effective
• Dietary strategies ..... 

Dietary strategies

• Oral supplements 2 hours before meal
• Finger foods
• Favourite foods
• Homelike environment (eg table cloths)
• Contrast colours of plate and food
• Make meal time a pleasurable occasion
• Background music
• Regular exercise
• Prevent dehydration

Frailty

• Rockwood (2003): multidimensional syndrome of loss of reserves (physical ability, cognition, health) which leads to increased vulnerability
• Fried (2001): weight loss, low grip strength, self reported exhaustion, slow walking speed, low physical activity
  – Weight loss, low activity, slow gait are all risk factors for dementia
• Cognitive impairment contributes to physical frailty
Frailty and Dementia

- Decreases in strength and walking speed ("frailty") antedate AD onset by many years
- In cohort study of 800+ older people, more AD cases developed in frail compared to non-frail over several years (Rush Aging and Memory Project)
- Low grip strength is associated with cognitive impairment in many cohort studies

Frailty and dementia

- Frailty and dementia may share common underlying mechanisms:
  - Cardiovascular and cerebrovascular disease risk factors for both frailty and AD
  - Raised levels of pro-inflammatory cytokines eg interleukins, CRP, TNF-α common to both, indicating possible state of low grade chronic inflammation
  - Mitochondrial malfunction
  - Oxidative stress

Recommendations

- Exercise:
  - Increases hippocampal size
  - Slows cognitive decline
  - Resistance/strength training (lowers interleukins and TNF-α)
- Address nutrition requirements
- Address psychological factors
Delirium

- Disorder characterised by rapid onset, altered level of consciousness, disturbances in attention, orientation, memory, thinking, perception & behaviour
- Dementia is the strongest risk factor for delirium
  - Presence of dementia ↑ risk of delirium x 5
  - 2/3 of cases of delirium occur in dementia
- Many cases unrecognised...
  - .. dementia blamed for symptoms

Confused Hospitalised Older People Study (CHOPS) Delirium Identification

- Lower cognitive reserve (lower education level) predicts higher risk of delirium
- More severe dementia predicts greater severity of delirium
- Multiple causes:
  - Acute medical illness and infection
  - Medications and alcohol
  - Discomfort and pain (eg urinary retention)
  - Hypoxia
  - Post operative
Delirium

- Both delirium and dementia associated with:
  - decreased cerebral metabolism,
  - cholinergic deficits
  - inflammation (causing oxidative stress)
- Delirium is associated with:
  - low ACh levels
  - excess dopamine levels
  - dysfunction in other neurotransmitters
  - low IGF-1

Recommendations

- Expect delirium in unwell and hospitalised older patients with dementia
- Assess regularly with CAM (Confusion Assessment Method)
- Treat underlying cause
- Keep mobile, well hydrated, orientated
  - Lighting, external cues, personal mementos
- Minimise bed moves
- Appropriate ward accommodation
- Minimal use of antipsychotic medication

Recommendations

- Educate staff and family
- Do not use anticholinergic medications
- Do not use physical restraints
**CHOPS strategy**

- Educate staff
- Build on existing strengths
- Engage clinicians and executive support
- Identify areas of need
- Know the patient
- Include family carer
- Practical approaches to care

*Slide courtesy of Prof Jacqui Close*

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**In summary**

- No systematic process for identifying patients with dementia or delirium
- Staff feel that their training is inadequate with less than half those surveyed having received training
- 80% staff exposed to aggression
- Increase cognitive screening, 8% → 67% (1 site)

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**Oral Disease**

Without protection of salivary enzymes and basic dental care teeth will rot away rapidly

*Slide courtesy of Peter Foltyn*
Oral disease

Poor oral health more common in people with dementia
- Increased plaque accumulation and caries
- Fewer natural teeth
- Dry mouth (xerostomia)
- Use dentures less often
- Occurs before diagnosis of dementia
- Chronic inflammation suggested as link between poor cognition and poor dentition

Why poor oral health?

- Deterioration in ability to self care
- Inability to follow instructions
- Decreased motivation and executive function
- Increasing dyspraxia and agnosia
- Decreased ability to adapt to changes such as dental plates or new dentures
- Combative behaviour during personal care
- Sucking reflexes and involuntary tongue movements in late stage dementia makes mouth care very difficult to deliver
Recommendations

• Integrate oral health care into care plan:
  – Twice daily brushing
  – Chlorhexidine containing mouth wash
• Dental review early in disease process with focus on retention of natural teeth
• Use adequate sedation for dental work in later stages of dementia
• Review medications, esp. antipsychotics, anticonvulsants, anticholinergics

Visual dysfunction

• Changes in visual acuity and contrast sensitivity, and visual field defects (with normal neuroimaging) may be early symptoms of AD and VaD
• Problems with colour vision and spatial localisation
• Blurred vision, reading, writing, depth perception, driving, locating familiar objects, identifying people or objects
• Occurrence of visual hallucinations may be linked with impaired visual acuity

Visual dysfunction

• Blue Mountains Eye Study – significant association between impaired visual acuity and cognitive impairment (MMSE<24)
• Age related macular degeneration is associated with cognitive impairment
• Possible increased incidence of glaucoma in people with dementia
• Retinal changes in AD:
  – Decrease in retinal nerve fibres
  – Vascular changes
**Recommendations**

- Be aware of possibility of visual problems
- Early optometry/ophthalmology review for refractive errors, intraocular pressures, cataracts
- Encourage people with moderate to severe dementia to use their spectacles

**Sleep dysfunction**

- Age related changes in sleep in most older people
- Circadian rhythm disrupted in AD with delays and fragmentation of the sleep-wake cycle
- Appears to be due to decreased cell numbers in suprachiasmatic nuclei (the “body clock” which controls circadian rhythm) and presence of tangles
- Loss of cholinergic neurones can lead to decrease in REM sleep especially in LBD
Lewy Body Dementia and Sleep

- REM sleep behavior disorder where people act out their dreams may be early symptom of PD and LBD
- Sleep disorder may precede LBD by years
- In most people, the brain turns off muscle activity during our REM sleep
- In REM sleep behaviour disorder, the brain part that “paralyses” people during REM sleep is damaged, allowing them to move about
- They may act out often violent dreams in which they are attacked or pursued – punching or kicking

Sleep dysfunction

- Increased night time wakenings and daytime sleeps; break down of sleep architecture
- Up to 50% of people with dementia or their carers report sleep disturbances
- Severity of disturbance increases with severity of dementia
- Sleep apnoea more common in people with dementia

Recommendations

- Exercise during day
- Adequate exposure to bright light during day
- Avoid/limit daytime napping
- Sleep hygiene measures
- Use sedatives with caution
- Possible use of melatonin (Circadin) to reset circadian rhythm and Bright Light Therapy
Urinary Incontinence in older people

- Increased vulnerability to incontinence
  - Age related changes in bladder, prostate gland (in men) and pelvic floor muscles (in women)
  - Medications and functional decline

Urinary Incontinence in dementia

- Loss of cognitive ability to interpret the sensation of a full bladder
- Loss of motivation to inhibit the passage of urine
- Inability to plan how to self-toilet
- Inability to find toilet or to reach toilet in time
- Dressing dyspraxia
- Visuospatial problems

Urinary Incontinence

- Occurs earlier in vascular dementia, LBD and FTD than in AD
- Possible causes for urinary incontinence:
  - **D**: delirium, drugs
  - **R**: retention, reduced mobility
  - **I**: infection, impaction
  - **P**: polypharmacy, polyuria
**Recommendations**

- Assess and treat reversible causes
- Prompted voiding 2 to 3 hourly
- Pelvic floor exercises
- Absorbent pads
- Beware anticholinergic medications
- Use catheterisation rarely

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**Dementia in NSW Hospitals**

- Hospital data 2006/07, pts. ≥ 50 yrs
- Linked to residential care data
- 252,000 pts, 733,000 episodes
- 20,748 people with dementia
- In 47% episodes, dementia not recorded as primary or secondary diagnosis

Brian Draper
UNSW

Australian Institute of Health and Welfare; Diane Gibson, U Canberra

**Costs of dementia care**

- 1-in-4 PWD in NSW \(\rightarrow\) hospital in 2006/07
- $462.9m of which 35% ($162.5m) dementia associated
- LOS: costs of additional bed-days for PWD (NSW) 2006-07 = $45m (35% of all additional bed days)
- Average cost hospital care (Age ≥70)
  - $8,061 higher when dementia was the primary diagnosis (vs. no dementia)
  - $3,659 higher when dementia was an additional diagnosis (vs. no dementia)

AIHW 2013. Dementia care in hospitals: costs and strategies. Canberra: AIHW.

### Rates common reasons for hospital care (50 yrs+)

<table>
<thead>
<tr>
<th>Reason</th>
<th>Dementia</th>
<th>Without Dementia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renal dialysis</td>
<td>9.0%</td>
<td>19.8%</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>6.3%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Dementia &amp; other cerebral</td>
<td>5.3%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Respiratory infections</td>
<td>4.3%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Other factors</td>
<td>4.1%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Kidney &amp; UTI</td>
<td>3.9%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Injuries</td>
<td>2.4%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Heart failure</td>
<td>2.4%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Digestive system disorders</td>
<td>2.3%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Stroke</td>
<td>2.3%</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

AIHW 2013. Dementia care in hospitals: costs and strategies. Canberra: AIHW.

### Difficulties within hospital

- High rate of confusion and delirium
- Behavioural and psychological symptoms of dementia (BPSD)
- Falls
- Negative staff attitudes and lack of skills
  - ageism, bias against dementia
  - lack of knowledge, skills, mentoring
- Low rate of identification of cognitive impairment
- Lack of consultation with family

AIHW 2013. Dementia care in hospitals: costs and strategies. Canberra: AIHW.
Prevalence in hospital

- Prospective observational study
- N = 493; 70 yrs+; 4 acute hospitals (Queensland)
- 29.4% cognitive impairment
- 20.7% dementia (47.7% ≥ 90yrs)
- Delirium at admission
  - 9.7% overall; 23.5% in PWD
- Incident delirium
  - 7.6% overall; 14.7% in PWD

Strategies to improve hospital outcomes for PWD

Strategies outside hospital

- Hospital-in-the-home
- Services within RACF
  - Special care units
  - Staffing levels & training
  - Aged care nurse practitioners
  - Nursing home doctors (Netherlands model)
  - Advance Care Directives
- Improving ED – ASET, ACE, environment


Strategies to improve hospital care

- Cognition clinical nurse consultants
- Dedicated nurse in ED
- Add ‘memory and thinking difficulties’ to admission and preoperative forms
- Include cognitive function in clinical handover
- Dementia-friendly environment

Strategies to improve hospital care

- Cognitive Impairment Identifier
- National standards on safety and quality
- Involvement of family in assessment and care
- Screening for cognitive impairment
- Special care wards for behaviourally disturbed

Conclusion

- In clinical practice many conditions associated with dementia are unrecognised
- It is important that these are identified and managed appropriately to improve the care of people with dementia and to improve their quality of life