Who is what?

- Clinical geriatrician (social geriatrician)
- Internist-elderly medicine
- Specialist-elderly care
- Geriatric nurse
Getting older, natural process

- Brain degeneration > dementia
- Sensoric degeneration > presbyacusis, cataract, decreased gnostic sensibility, loss of smell and taste
- Thinner skin, dryness
- Musclemass decreases 1%/yr, sarcopenia
- Decreased renal function, 80yrs 50%
- Decreased cardial output > heart failure
- Decreased intestinal mobility > presesophagia, constipation
- Decreased pulmonary function > emfysesma
- Stiffening of arteries > hypertension
- Artrrosis, osteoporosis
Case man 72 y.o.

- Goiter operation
- Hypercholesterolemia
- Peripheral artery disease, PTA 1997
- 2003 PTA aorta bifurcation via right iliacal communis artery
- Arteria subclavia stenosis left
- COPD Gold 2
- Hernia inguinalis
- 2008 suspicion of coronary artery disease
- 2009 LVEF 45%, hypokinesia
Is seen on the memory clinic

- He can’t tell why he is referred
- Diffuse or windy speech, not to the point
- Anamnestic: problems in naming of objects, people
- Forgets intentions
- Not evident afatic, agnostic, apractic and no problems in executive functions
- Dyspnea with exertion, bruising with medication, sometimes rectal red blood loss (hemorrhoids)
- IADL by his wife, MMSE 25/30
• Patient stopped smoking, but his wife smokes
• Alcohol 1 unit/day

• Positive family history: father sudden death 79 y.o., mother died of heart disease
• formoterol/budesonide (Symbicort),
• tiotropium (spiriva)
• Atrovent
• bumetanide 1dd2mg
• captopril 3dd 12.5mg
• carbasalaat calcium 100mg
• clopidogrel 75mg
• isosorbide-5-mononitroaat ret 25mg+50mg,
• rosuvastatine 1dd 40mg
• finasteride 5mg
• tamsulosine 1dd 0.4mg
• Not ill looking, bruises, RR not measureable, systolic murmer over the heart, carotis no murmer, not palpable
• Both sides rales over the lungs
• No edemas, pulsations not palpable
• What does the patient have?
Vascular cognitive disturbances
A overview

- When do we speak of dementia
- Vascular cognitive impairment/dementia
- Risk factors
- Diagnostics
- Treatment
What is dementia?

- Celsus: permanent insanity after delirium in fever
- Pinel (1818): Loss of intellectual and memory functions, disorderly conduct, superficial emotions, aimless activities, forgetting of words (schizophrenia, retardedness, senile dementia)
- Esquirol (1772-1840): acquired psychologic demise
• 19th century: brain pathology; arteriosclerotic and senile psychoses
• 1898 Alzheimer: describes a case of a woman with dementia. Not only arteriosclerotic demise
DSM-IV-TR

- 1. memory deficit
- 2. disturbance in one of the following cognitive domains: language (aphasia), act (apraxia), visual recognition (agnosia), executive functions (problems with planning, organizing, applying order, abstract thinking)
- 3. Limitations in social or professional life (work), significant limitation compared with earlier level of functioning
- 4. Delirium is excluded
but: Mild cognitive impairment

- Does not fulfill the requirements of dementia, but does display disturbances

- Syndrome diagnosis:
  - Cognitive complaints
  - Disturbances in neuropsychological tests
  - No dementia

Amnestic MCI

Non-amnestic MCI single domain

Multiple domain (amnestic) MCI

Vascular cognitive impairment
- http://europe.obgyn.net/nederland/mp/overgang/overgangli27.html
Prevalence

- 1.5-16.3% (4-20% in academical setting)
- Depends on used definitions
- Increases with age

GP registration (2010):
- Prevalence dementia: 1.9-4.3/1000 (65+ 14-25/1000)
- Incidence dementia: 0.8-1.5/1000 (65+ 5.8-8.9/1000)
• De Hollander et al., 2006
NINDS-AIREN criteria

Criteria for vascular dementia

1. Signs of cerebral vascular disease with neurological investigation or on imaging (Infarction of the large vessels, strategic infarctions-angular gyrus, thalamus, basal ganglia, brainstem, lacunar infarcts, extensive white matter lesions)

2. Time interval:
   – Dementia develops 3 months after stroke
   – Acute deterioration of cognitive functions
   – Fluctuating, stepwise progression of cognitive deficits

Probable, possible, definite
Hoge specificity, low sensitivity
Other expressions

• Parotonia
• Urine-incontinence, fecal incontinence
• Polyneuropathy
• Albuminuria
• Gait disorders/falls
• Apathy, loss of initiative, hypomimia
• Depression, loss of decorum
• Agressivity
• Nocturnal unrest, hallucinations
• Pseudobulbar disease: pathological crying and/or laughing
• Lack of disease awareness and understanding
Vascular dementia is a broad term

- Microangiopathy: subcortical and white matter lesions, lacunar infarctions (Binswanger)
- Ischemic large vessel disease
- Hypoperfusion because of heart failure
- Hypoxia after cardiac arrest
DD

- CADASIL (cerebral autosomal dominant arteriopathy with subcortical infarctions and leukoencephalopathies)
- Vasculopathies: arteritis temporalis, polyarteritis nodosa, primary cerebral angiopathy, lupus erythematosus and moyamoya (Japan)
Spectrum

- Vascular dementia vs. M. Alzheimer
- Mostly common risk factors, anatomically (mixed diseases) – neuropathologically, inflammatory mechanisms
riskfactors
vasc.dementia

- AGE
- Hypertension (Ladis)
- Diabetes mellitus (Prosper-brain atrophy)
- others: dyslipidemia, apolipoprotein E (APOE) ε4/4 genotype (Alzheimer), genetic, physical inactivity, vitamin D status, vitamin B6 status, homocysteine, BMI, sex, smoking, atrial fibrillation, lipoprotein-associated phospholipase A2
Pathology

• Damage to fiber network: myeline-and axonal loss
• Astrogliosis, loss of oligodendrocytes and microglia activation
• Lipohyalinosis, arteriosclerosis, vessel leakage and venous collagenosis
• Ischemia/hypoxia
• General hypoperfusion (autodysregulation)
• Leakage bloodbrain barrier
• Serum protein leakage, inflammatory reactions, degeneration and congofile amyloid angiopathy
• Severe white matter lesions also give hippocampus atrophy
Systemic inflammation and MCI

• TNF-α and Serum amyloid A higher in people with MCI

• multiple domain MCI higher IL-1β en IL-12, TNF-α, SAA en PAI-1
Diagnostics

- On Aruba: **Centro di memoria**
- CamCog
- CT cerebrum, or MRI if necessary
- Extensive bloodwork
- Geriatric nurse assessment

- (LP, EEG)
Anamnesis/Physical examination

- Ask for memory complaints, problems with naming, recognition, planning
- ADL/IADL (interference with daily living)
- General physical examination
Neurological investigations

• Extrapiramidal symptoms: shuffling gait, hypomimy, hypofonic dysartria, Cogwheel rigidity
• Piramidal: Barre, Babinski,
• Inexhaustible ankle clonus (ALS), hypertonia
• Pseudobulbar: weakness facial muscles
• Vivid uvular/faryngeal reflexes
• Postural disturbances
Do it yourself…MMSE

• Results dependent of age and education level
• MMSE; grey area 25-28
• Discrepancie MMSE-functioneren
Neuropsychological testing

- On the CDM by the psychologist

- (LADIS): Diabetes mellitus, hypertension and prior stroke

- Interferes with: executive functions, speed/motor control, attention, naming and visuoconstructive praxis

- Memory tasks, language (DM)
MRI: Fazekas scale

- Classification for white matter lesions:
  - Punctate
  - Early confluent
  - Confluent

- Lacunar infarcts: none, a few 1-3, many >3
MRI (conventional T2)

- The intensity of WML is associated with gait/balance disturbances and cognitive problems. A simple measurement of white matter lesions is as good as a complex one.

- Location of lacunes determines also the development of cognitive disorders, independently of the extensiveness of the white matter lesions.
  - Thalamus: lower MMSE, worser motoric control and executive functions.
  - Putamen/globus pallidus: worser memory and motoric functions.
• Elderly with SVID (small vessel ischemic disease) and vascular risk factors have more risk of progression of white matter lesions and lacunes
• Not all lesions are visible on MRI (cortical microinfarcts and tissue changes)
• Up to 30% nonpatients with white matter lesions (7% severe)
• T1 relaxation time MRI: measuring kquantitative axonenloss
• DTI (diffusie tensor imaging): axon/myeline loss and microglia activation
LP?

- No relation with AD biomarkers: amyloid beta-1-42 (lowered), tauproteine (elevated), gefosforyleerd tauproteine (elevated)
- Possible relation: neurofilament light protein (NFL) elevated; expression of axonal damage = not predictive
Ophthalmologist

- OR 1.95 (1.04 to 3.62) with retinopathy for development of vascular dementia
Damage starts early

- Cardiovascular risk factors, aging and incidence of dementia study (CAIDE):
  - Midlife overweight (RR2.53)/obesitas (RR2.94)
  - Hypertension in midlife (2.73)
  - Lowering hypertension only in midlife effect
  - Hypercholesterolemia not, statines is protective (0.13)
Once there is damage…

- 3x more chance on dementia compared with people without subcortical ischemic vascular disease (extensive white matter lesions or lacunar infarcts whit white matter lesions) – 3 years FU
- Because of: progressive lesions, CVAs
- 5-year survival: 39% (!)
MCI - prognosis

• Canadian Study of Health and Aging, 149 patients 79.3 ± 6.7 years; 61% women
• 77 dead (52%)
• 58 dementia (46%)
• 32 no dementia, 7 worsened cognition, 4 improved
What to do?

• Treat hypertension!: Ca-antagonisten, RAAS
• Avoid hypotension or orthostasis
• Insufficient proof for statins (Prosper), CAIDE: could be beneficial
• Memantin: proof on cognitive function is unclear
• Vitamine D?
• Exercise?! OR 0.62
Our patient:
Take home messages

• Be aware of cognitive problems in ‘vascular patients’
• MMSE of lesser use– Anamnesis!
• HDL – ADL function
• If there is suspicion refer to memory clinic for diagnosis/counseling
• Optimise bloodpressure, DM


• Progression of impairment in patients with vascular cognitive impairment without dementia. C. Wentzel et al , Neurology August 28, 2001 vol. 57 no. 4 714-716