Orthostatic hypotension in dementia

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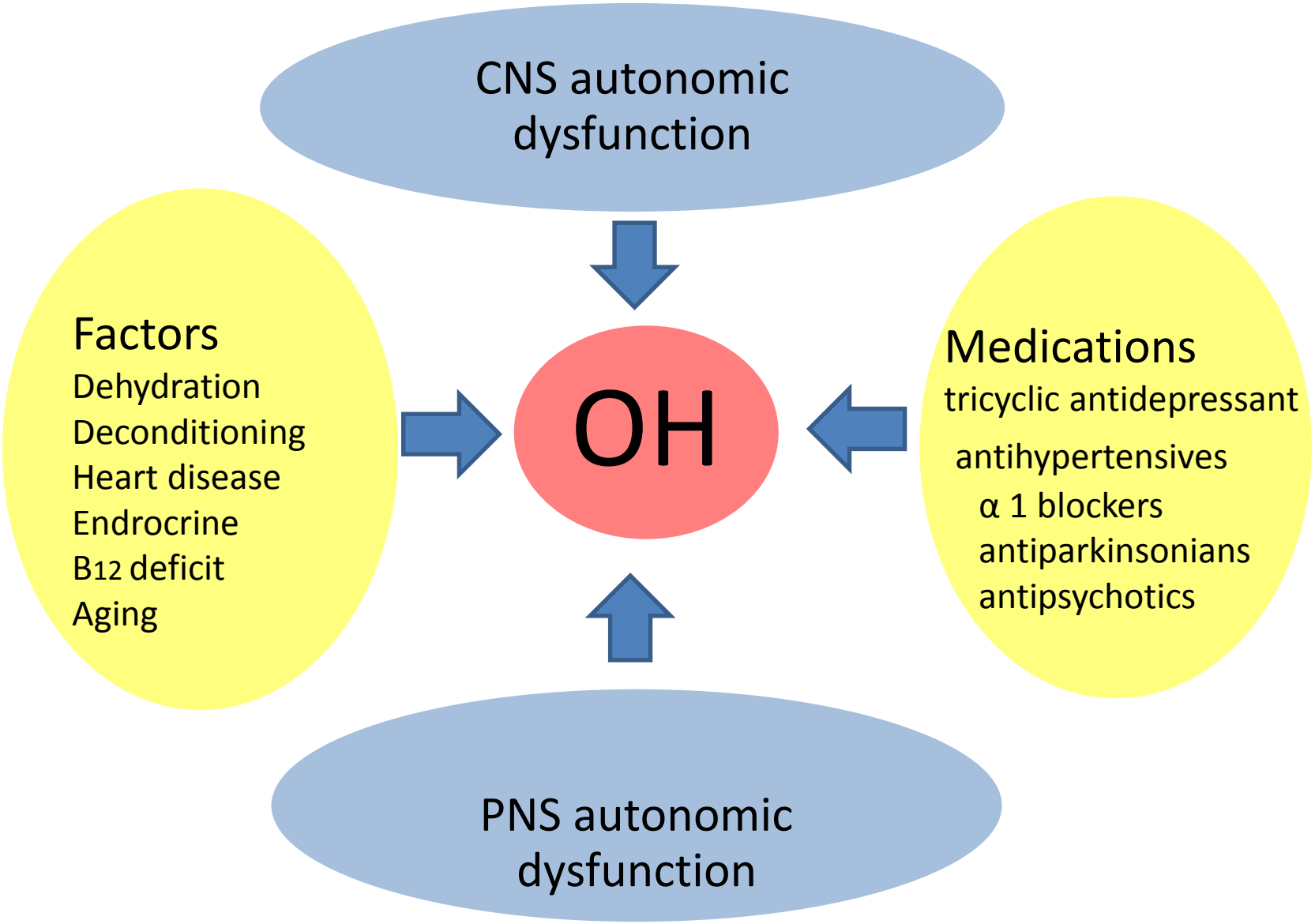
Disclosure

- The author declare no conflicts of interests

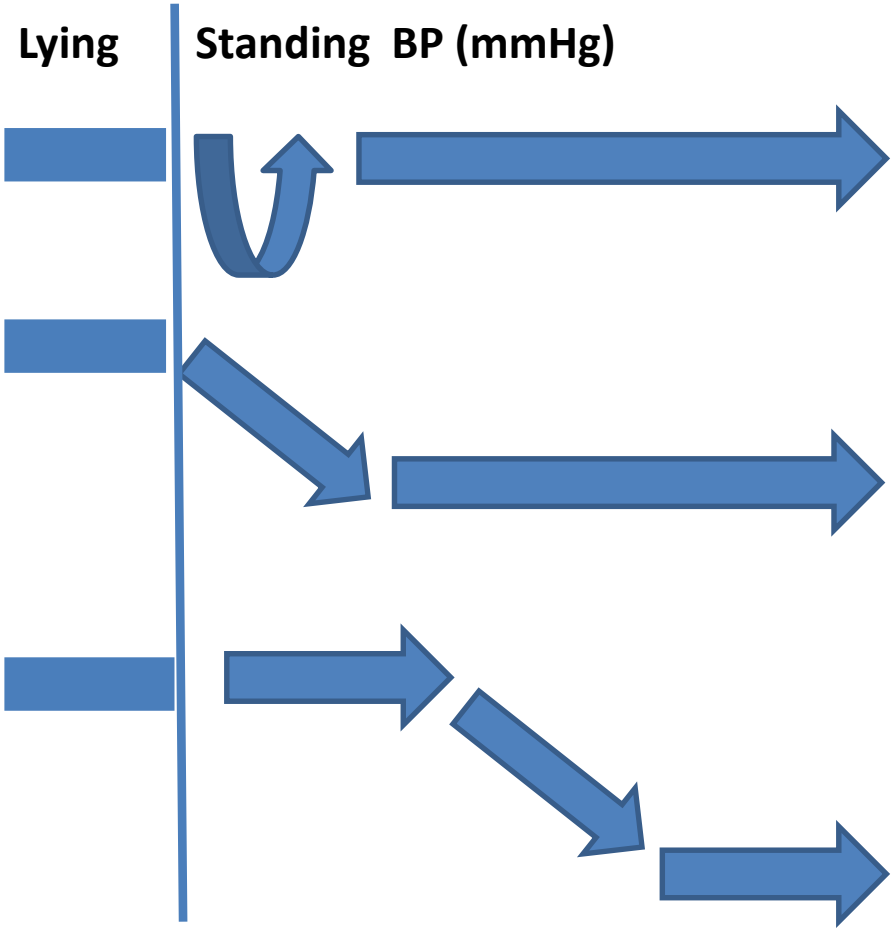
Learning Objectives

- Clinical relevance of OH in dementia
- Symptoms associated with OH
- OH in different dementing process
- Strategies for OH management
- Key message: OH must be consider in the evaluation of patients with dementia


CNS autonomic dysfunction
Factors
Dehydration
Deconditioning
Heart disease
Endrocrine
B12 deficit
Aging
OH
Medications
tricyclic antidepressant
antihypertensives
α 1 blockers
antiparkinsonians
antipsychotics
PNS autonomic dysfunction

TYPES OF ORTHOSTATIC HYPOTENSION

Freeman R. Clin Auton Res (2011)

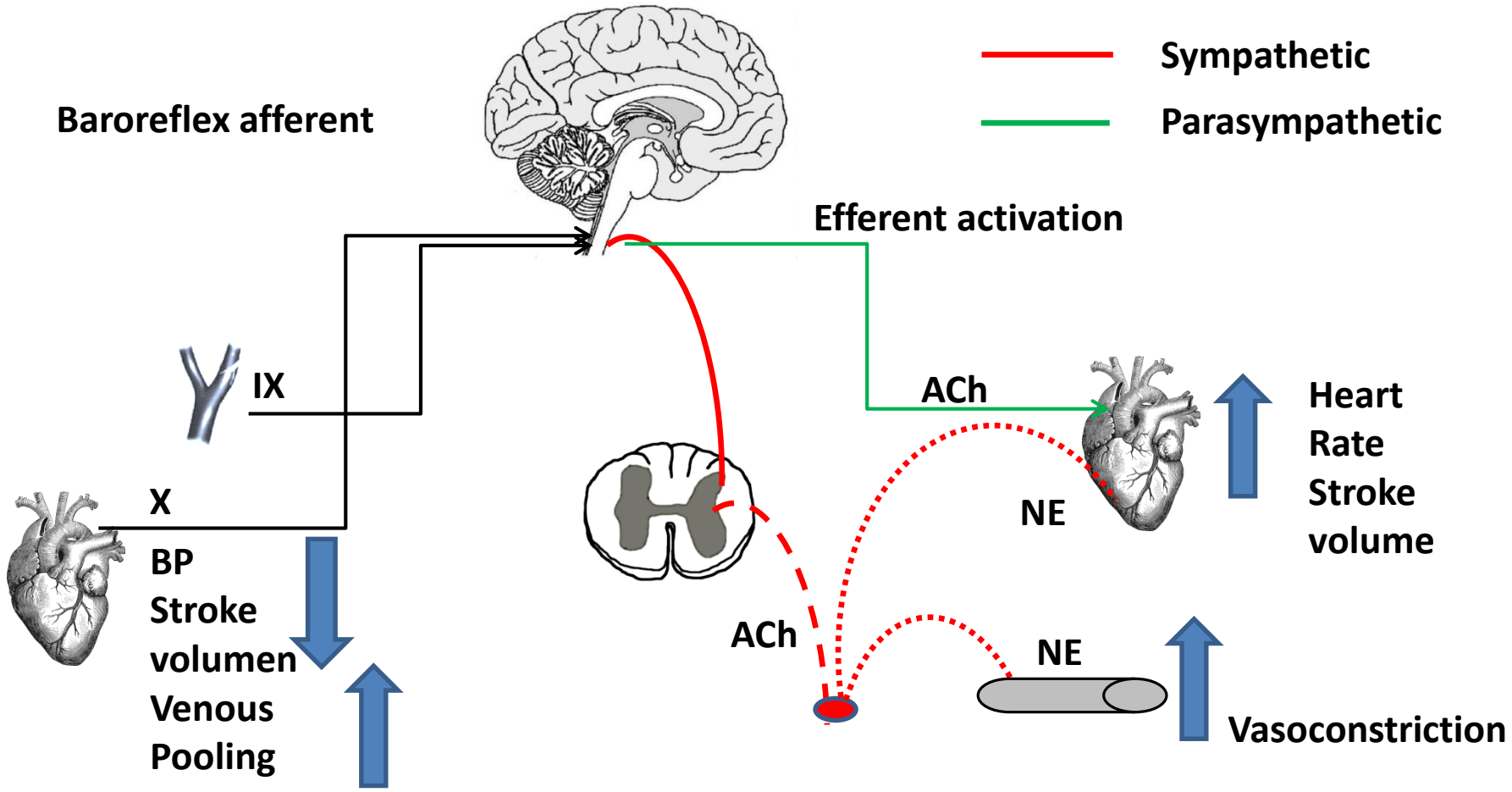


INITIAL: transient BP fall (within 15 sec)
SBP > 40 mmHg, DPS > 20 mmHg

BP reduction within 3 min of standing
SBP ≥ 20 mmHg, DBP ≥ 10 mmHg

DELAYED: BP reduction after 3 min of standing SBP ≥ 20 mmHg, DBP ≥ 10 mmHg

AUTONOMIC ACTIVATION ON STANDING simplified scheme



Orthostatic symptoms in Dementia

Classical symptoms

Blurred vision and dizziness on standing

Light headedness

Lower limbs weakness (on standing or walking)

Neck pain in sub occipital and Para cervical region

Syncope (postural, with Valsalva maneuver)

Unconventional symptoms

Cognitive fluctuations (slowing while standing)

Leg pain while standing, Lethargy, fatigue

Sleeping in chair, sleeping at meals

Associated manifestations

Falls, myocardial infarction, increased mortality

Orthostatic hypotension in dementia

Asymptomatic → Symptomatic

30% of patients with OH
Chelimsky T
The American Journal of Medicine (2009)
63% of dementia patients with OH
Bengtsson-Lindberg M
Clin Auton Res (2015)

- Diurnal variability
- Postprandial
- Hot environment
- Dehydration
- Deconditioning
- Comorbid condition
- Drugs

Comparative studies of Orthostatic hypotension in dementias

Authors	n	mean age	Orthostatic hypotension (%) DLB	PPD	Alz	VaD	FTD	Controls
Passant (1997)	151	76			39	52	46	
Allan (2007)	139	76.5	52	49	34	34		13
Sonnesyn(2009)	196	75.6	42	55	41	31.6		14
Mehrabian (2010)	267	76.5			15	22		4
Bengtsson-L (2015)	154	76	70		33			13

OH and DLB

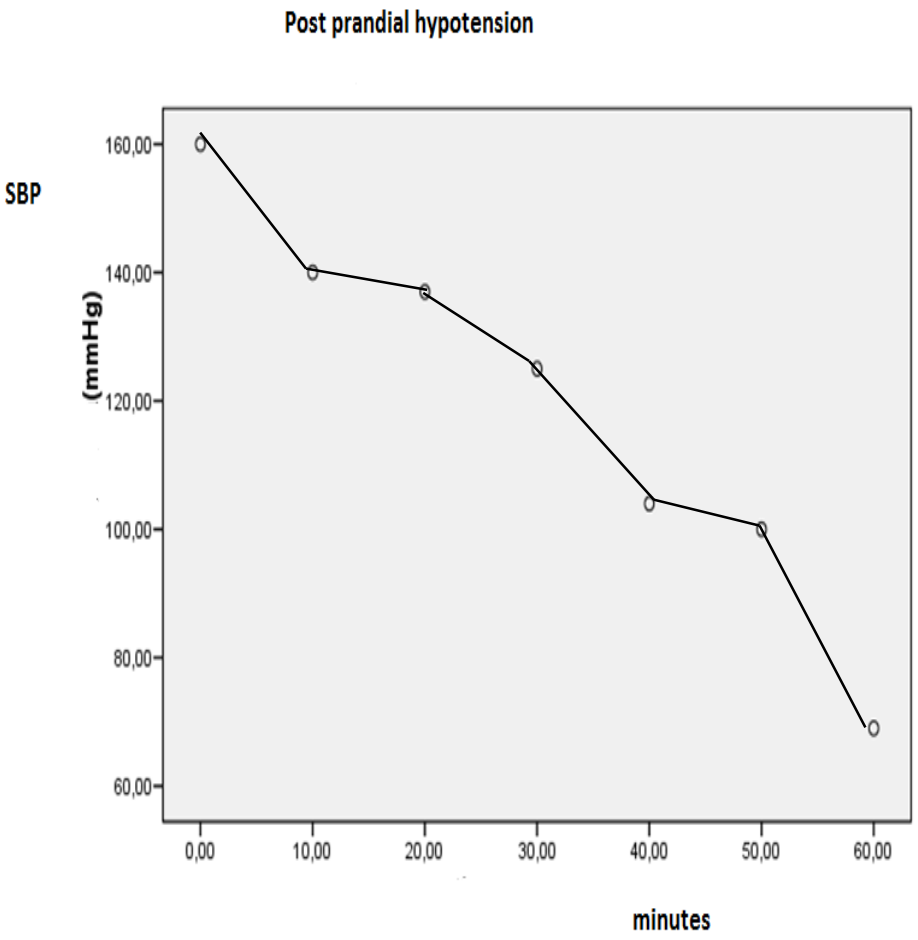
- **Pathology**: α synuclein Lewy bodies and neurites
- Sites Medulla: ventrolateral, raphe nuclei
- Peripheral autonomic ganglia
- OH orthostatic symptoms and OH are frequent (Thaisettawatful Neurology 2004)
- OH associated with systolic and diastolic BP fall
- OH more severe than AD (Andersson M. Int J Geriatr Psychiatry 2008, Oka J Neurol Sci 2007)
- OH associated with shorter survival (Stubendorff K. PLoS One 2012)

Case DLB

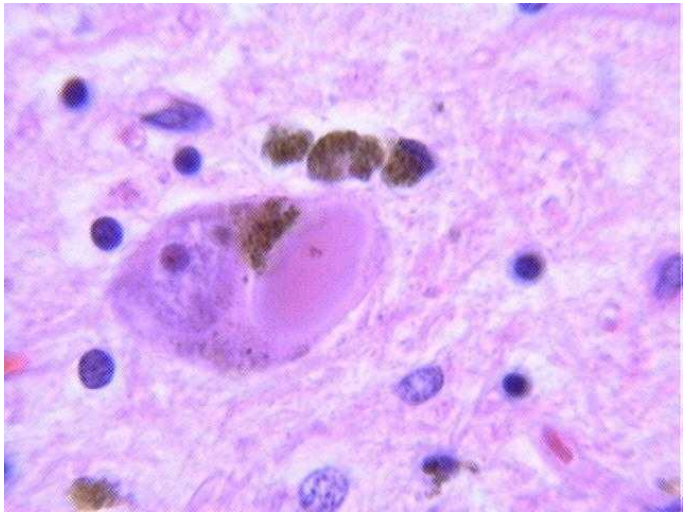
- 79 years old, male . Since 4 years memory loss and visual hallucinations
- His son noticed that the patient has cognitive fluctuations
- Micturition symptoms: urgency and incontinency
- Severe post prandial symptoms
- Gastrointestinal: severe constipation

  BP (mmHg) supine = 156/80 standing = 100/76
- BP (mmHg) Post prandial: 69/ 39 (40 min.)
- Cardio vagal: abnormal
-

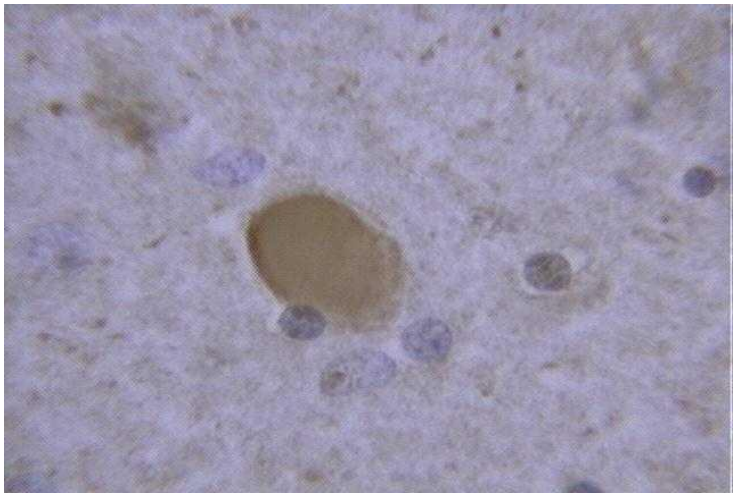
Case DBL



Substantia nigra (Lewy bodies H & E



Ubiquitine stain



OH and Parkinson´s disease

- **Pathology**: α synuclein Lewy bodies and neurites
- Sites Medulla: rostral ventrolateral, raphe
- Spinal cord: intermediolateral cell column
- Peripheral autonomic ganglia
- Sympathetic nerve terminals (heart)
- OH 20-50% of PD in older patients at later stages

  OH no association with cognitive decline (Studendorff PLoS One 2012)

  OH predictor of dementia (Anang J Neurology 2014)
-

OH and Alzheimer' disease

OH reported in 15-40% AD patients

Comorbidities (Stroke, Diabetes, drugs)

Findings:

OH is mainly due to systolic BP fall on standing

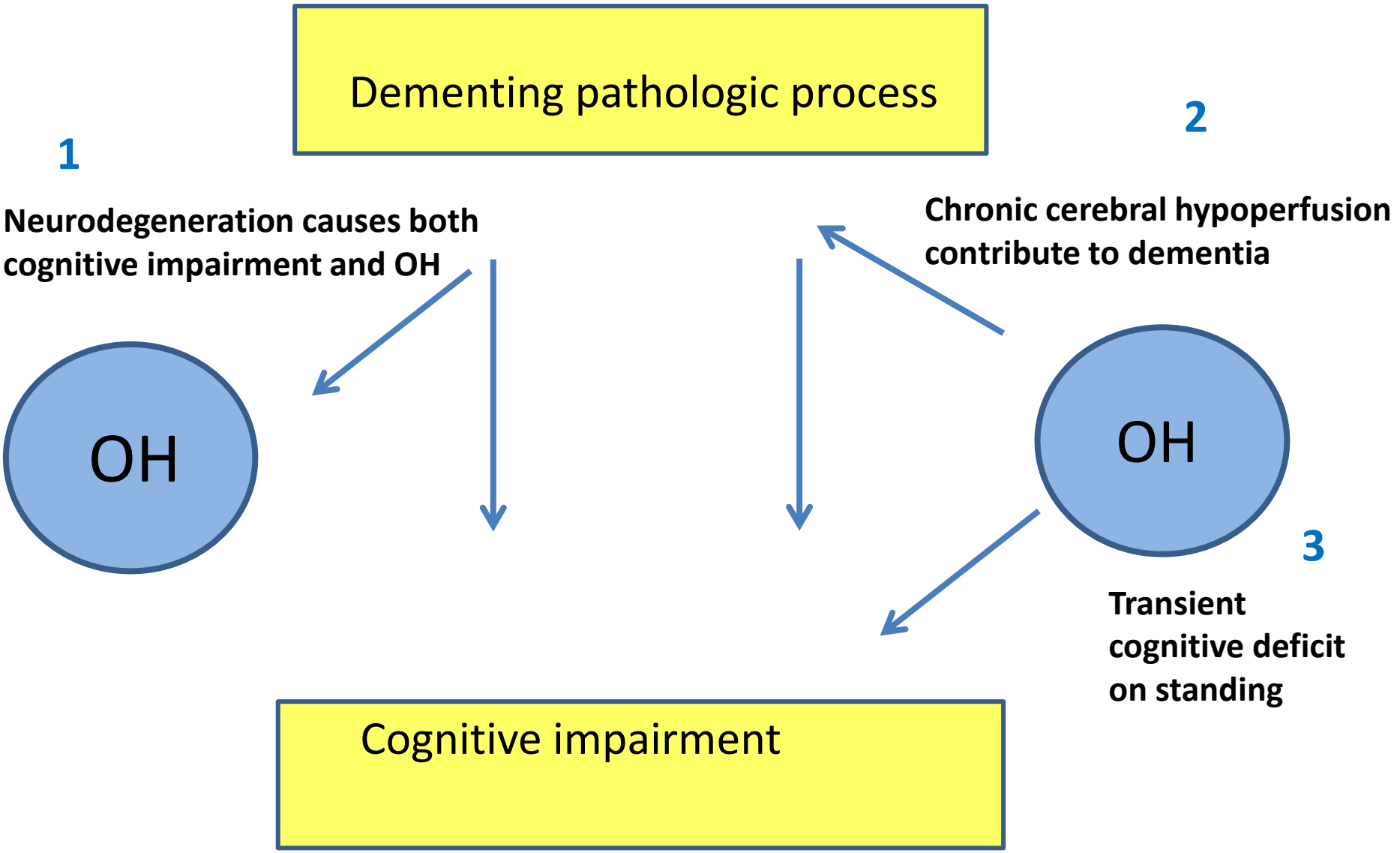
Absent of cardiac sympathetic denervation (Joong-Seok J Neurol Sci 2015)

OH is more frequent in mixed dementia (Alzheimer + Vascular) than Alzheimer patients (Bengtsson-Lindberg M Clin Auton Res 2015)

OH and Vascular dementia

- OH reported in about 20% and probably is multifactorial
- OH associated with large cerebral artery infarction (Xiong L J Neurol Sci 2013)
- OH is associated with comorbidities (Coronary artery disease Diabetes, drugs) (Phipps J Neurol Sci 2012)

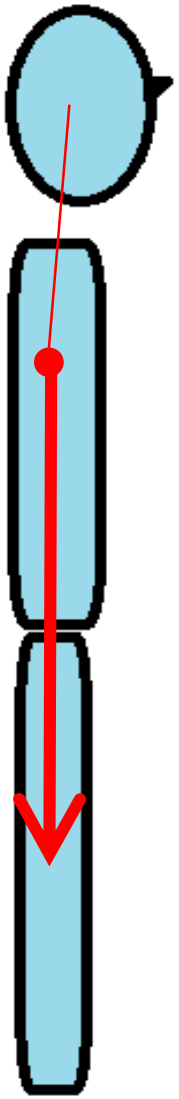
Mixed dementia (Alzheimer + Vascular)


Dementing pathologic process
1
Neurodegeneration causes both cognitive impairment and OH
2
Chronic cerebral hypoperfusion contribute to dementia
OH
OH
3
Transient cognitive deficit on standing
Cognitive impairment

OH and Cognitive impairment in Dementia

- 1. Neurodegeneration process affects cognitive areas and sites related with BP control
- 2. OH produce cerebral hypoperfusion (mainly in frontal lobes) increasing the underlying pathologic process
- 3. The effect of OH on cognitive function could be transient, during standing position, aggravating the mental status (fluctuations)
- (Sambati L. Neurol Sci. 2014)

OH Strategies for treatment



Non pharmacologic

Education: recognition of different symptoms
daily life activities, ambient temperature
postural maneuvers
discontinue aggravating drugs
support stockings, abdominal binding
Sleep: head elevated (15 to 30 cm)
(avoid effect of supine hypertension on brain vessels)

Volumen expansion: fluid daily =2- 2.5 L, Na = 8-10 g
drink water rapidly (500 cc)

Diet: Avoid carbohydrates, frequent small meals
avoid alcohol

Pharmacologic treatment

Fludrocortisone
Midodrine
Pyridostigmine
L-DOPS

Approach to evaluation and treatment of OH in dementia patients

- 1. Collect information from caregivers
- 2. Identify worsening factors
- 3. Exclude non-neurogenic diseases causing OH

  4. Evaluate the impact of OH in daily life activities
- 5. Is it relevant to measure orthostatic BP changes, including those patients without classical symptoms of OH
- 6. Treatment of OH may help to avoid falls and possibly to improve cognitive fluctuations

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