Spastische parese
pathofysiologie en klinimetrie

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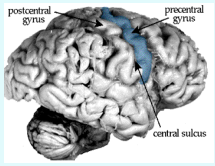
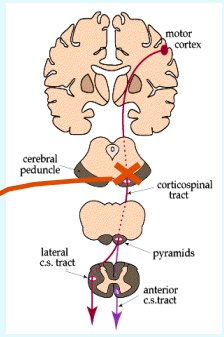
Prevalentie spasticiteit

- CVA: 38-60% (O'Dwyer et al, 1996; Watkins et al, 2002; Sommerfeld et al, 2004)
- Dwarslaesie: 65-78% (Skold et al, 1999; Maynard et al, 1990)
- Multiple sclerose: 84% (Rizzo et al, 2004)
- Cerebrale Parese: 88% (Becher et al, CBO richtlijn 2006)
- Traumatisch hersenletsel?

Pyramidale aandoeningen





- ✓ Parese
- ✓ Verlies motorische selectiviteit
- ✓ Hyperreflexie
- ✓ Pathologische reflexen
- ✓ Verhoogde tonus ("spasticiteit")

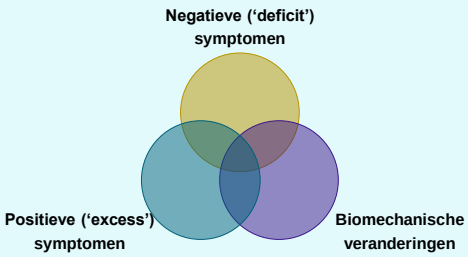
Definities spasticiteit

"A motor disorder characterized by a velocity-dependent increase in tonic stretch reflexes (muscle tone) with exaggerated tendon jerks, resulting from hyperexcitability of the stretch reflex, as one component of the UMN syndrome" (Lance, Neurology, 1980)

"Disordered sensorimotor control, resulting from UMN syndrome, presenting as intermittent or sustained involuntary movement" (Pandyan, Disabil Rehabil, 2005)

Diverse definities → géén consensus
(Malhotra et al., Clin Rehabil, 2009)

Spastische parese



Spastische parese

Positieve kenmerken:

- Proprioceptieve reflexen: hyperreflexie / clonus, spasmen
- Exteroceptieve reflexen: terugtrekreflex, positieve steunreactie
- Efferente drive: geassocieerde reacties, co-contractie, "dystonie"

No reflexes

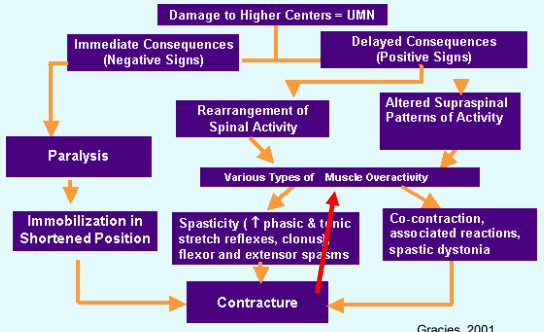
Negatieve kenmerken:

- zwakte
- verlies van motorische selectiviteit
- vermoeidheid
- vaardigheidsverlies

Secundaire symptomen:

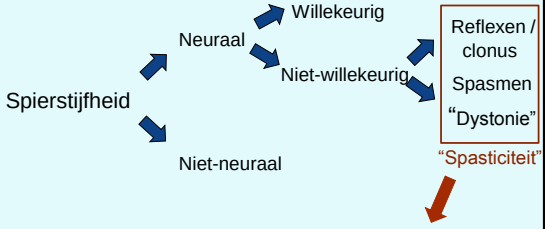
- spierstijfheid
- contracturen

Spastische parese



Gracies, 2001

Spierstijfheid



Onbalans tussen agonisten en antagonisten

Kliniek

Casus

Courtesy J. Fleuren, G. Snoek

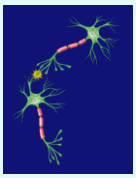
Spasticiteit

Essentiële kenmerken:

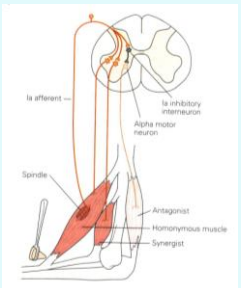
- Ontremming fasische, tonische en statische (rek)reflexen
- Onwillekeurige spieractiviteit

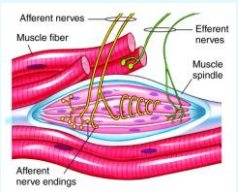
↓

- "Primitieve" flexie- en extensiepatronen



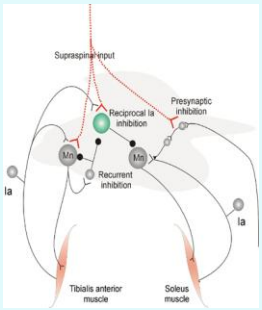
Spinale spierreflexen

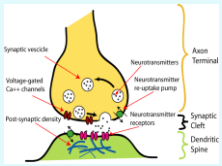




- Nuclear bags → Ia aff. → rek
- Nuclear chains → Ia / II aff. → rek en positie

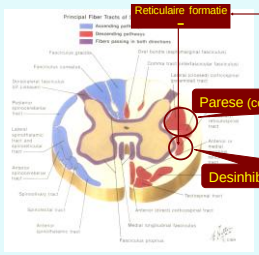
Supraspinale ontremming spinale reflexen





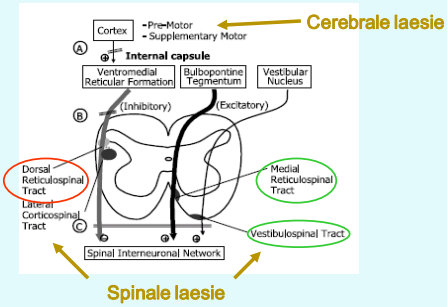
- O.a. belangrijke rol voor GABA bij inhibitie van reflexen
- Baclofen = GABA agonist

Supraspinale banen



pyramidaal + parapyramidaal = "UMN" syndrome

Bulbospinale banen



Klinimetrie

Neurologie / diagnostisch: aan- of afwezig

Revalidatie / therapeutisch:
- mate van spasticiteit
- mate van ongemak / beperkingen
- voor én na behandeling

► Geen gouden standaard!

Meten van spasticiteit

- Klinische schalen (Platz et al, 2005)
  - (M)AS
  - Tardieu
- Biomechanische methoden (Wood et al, 2005)
  - Pendulum test (relaxatie index, elbow & knee)
- Neurofysiologische methoden (Voerman et al, 2005)
  - Pendulum test (+ EMG, elbow & knee)
  - The spasticity test (inertial sensors + EMG, knee & ankle)
  - H-reflex
  - 24-uurs EMG

Disability and Rehabilitation, 2005;27(1/2)

Klinische schalen

Subjectieve beoordeling door clinici / patienten

1. Beoordeling van spiertonus
   (b.v. (Modified) Ashworth Scale, Tardieu, VAS)
2. Beoordeling van ROM
   (b.v. goniometrie, inter-knee distance)
3. Beoordeling van klinische fenomenen
   (b.v. spasm frequency scale, peesreflex score, clonus score)

Ashworth scale

Diverse studies → conflicterende resultaten:

- Meestal zwakke correlatie tussen reflexactiviteit en (M)AS
- Betere correlatie tussen rekweerstand en (M)AS

Stop using the Ashworth Scale for the assessment of spasticity

J F M Fleuren,[1,2] G E Voerman,[1,3,4] C V Erren-Wolters,[1] G J Snoek,[1,2] J S Rietman,[1,2,5] H J Hermens,[1,6] A V Nene[1,2]

J Neurol Neurosurg Psychiatry 2010;81:46–53. doi:10.1136/jnnp.2009.177071

Score	Description
0	No increase in muscle tone
1	Slight increase in tone giving a catch when limb was moved in flexion or extension
2	More marked increase in tone but limb easily flexed
3	Considerable increase in tone – passive movement difficult
4	Limb rigid in flexion or extension

(Ashworth, 1964; Bohannon & Smith, 1987)

A five-step clinical measure

1. Tardieu scale slow
2. Tardieu scale fast (Δ = spasticity angle)
3. Active ROM (against spastic muscle)
4. Frequency of rapid alternating movements
5. Motor capacity (e.g. Modified Frenchay Scale UE)

Gracies et al., Eur J PMR, 2010

Funktionele evaluatie

- ICF-functies: pijn, aROM, pROM, spiertonus & kracht
- ICF-activiteiten: handvaardigheid, lopen, ADL
- ICF-participatie: werk, hobby, relaties
- Goal-attainment scaling (GAS)

Goal Attainment Scaling

- Individuele doelen
- Mate van succes → in hoeverre wordt doel bereikt
- Geen bodem- of plafondeffecten / individuele sensitiviteit
- Expliciete communicatie met patiënten and mantelzorgers

-2	-1	O	+1	+2
Veel minder	Beetje minder	Verwacht effect	Beetje meer	Veel meer

Goal Attainment Scaling

- Weight = importance (0-3) * difficulty (0-3)
- Rating = weight * effect

-2	-1	O	+1	+2
Veel minder	Beetje minder	Verwacht effect	Beetje meer	Veel meer

Conclusies

Spasticiteit…….iedereen 'kent' het, maar……

- Geen consensus over definitie
- Vele symptomen (positief, negatief, secundair)
- Pathofysiologie grotendeels onbekend (ook perifeer!)
- Geen gouden standaard voor klinimetrie