Spasticity in patients with disorders of consciousness

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Introduction
Motoneuron lesion

- Upper motor neurone lesion (i.e. cerebral infarction)
- Upper motor neurone lesion (i.e. corticospinal tract)
- Lower motor neurone lesion (i.e. at nerve root)
- Lower motor neurone lesion (i.e. of peripheral nerve)

Synapse
Strech reflex

Protection

Monosynaptic reflex
Control from CNS
Trouble

**Definition:** Exageration of myotatic reflex leading to an unvoluntary muscle contraction after muscle streching or a permanant muscle contraction

**Causes:** alteration of 1\textsuperscript{st} motoneuron (CNS) in the spinal cord or in the brain

**Aggravating factors:** Velocity of streching, Fatigue and stress
Complication

Spastic hypertonia

- Muscle retraction (decreased number of sarcomeres)
- Irreversible stiffness of joints
- Vicious positions and pain
Muscles involved

**Upper limb:**
- Shoulder: rot intern adductor
- Elbow: flexor
- Wrist: flexor pronator
- Fingers: intrinsic muscles

**Lower limb:**
- Hip: adductor internal rot
- Knee: extensor
- Ankle: plantar flexor inversor = equinus varus
Spasticity in DOC
Aim

Assessing spasticity in VS/UWS and MCS patients

- Diagnosis
- Treatment
- Time since insult
- Pain (*Nociception Coma Scale Revised* - NCS-R)
Method

- 57 patients (37±15 ans)
- 36 traumatic / 21 non-traumatic
- 22 VS/UWS
- 35 MCS

**Scale**: Modified Asworth Scale (MAS)

⇒ Biceps (most impaired limb)

**Nociception**: Nociception Coma Scale-Revised (NCS-R)
Results

- 84% of DOC patients are spastic (n=48; MAS ≥ 1)
• 84% of DOC patients are spastic (n=48; MAS ≥ 1)
• 67% suffer from severe spasticity (n=32; MAS ≥ 3)
No ≠ between VS/UWS and MCS (Modified Ashworth Scale)
Etiology

No $\neq$ difference between TBI and non-TBI patients (Modified Ashworth Scale)
Significant ≠ between treated and non-treated patients (Modified Ashworth Scale)
Positive correlation between time since insult and spasticity (Modified Ashworth Scale; p=0.05)
Positive correlation between *spasticity* (Modified Ashworth Scale) and *nociception* (Nociception Coma Scale-Revised; p=0.03)
Conclusion
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1. Patients with antispastic treatment + spastic than patients who are not treated
   ⇒ spasticity is not entirely treated
2. Correlation between spasticity (MAS) and pain (NCS-R)
   ⇒ Spasticity lead to pain ⇔ confort & quality of life
3. Correlation between time since insult and spasticity (MAS)
   ⇒ Spasticity (& after effect) could ↑ with time
Conclusion

Spasticity is frequent in patients with disorders of consciousness (67%).

Actual treatment are not sufficient to treat entirely spasticity.

Spasticity could increase pain, especially during mobilizations.