Post-polio syndrome – pharmacological treatment

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Pharmacotherapeutic strategies in PPS

- Aetiological treatment
- Symptomatic treatment
Pharmacotherapeutic strategies in PPS

- Avoid negative side-effects of pharmacological treatment
Post-polio syndrome – most common symptoms

- Increase of weakness or new muscle weakness
- Fatigue
- Pain
Pathophysiology

- Overstress of remaining motor units.
- Overuse of remaining motor units.
- Age.
- Amyotrophic lateral sclerosis (ALS).
- Persistent polio virus infection.
- Immunological factors.
Post-polio syndrome – most common symptoms

• Increase of weakness or new muscle weakness
  Pyridostigmine
  Q-10

• Fatigue
  Pyridostigmine
  Amantadine
  Q-10
  Modafinil
  Lamotrigine

• Pain
  Painkillers
Pyridostigmine

• Increases (stabilizes) the activity at the neuromuscular junction

• No effect - Trojan et al 1999

• Slight effect on walking distance – Horemans et al 2003
Amantadine

- Used in MS fatigue
- No effect – Stein et al 1995
Co-enzyme Q 10, ubiquinone, enhances energy production in the cell.

Increased energy metabolism – Mizuno et al 1997

No effect – Skough et al 2008
Modafinil

- Increases central nervous system activity
- No effect on fatigue – Chan et al 2006
- No effect on fatigue – Vasconcelos et al 2007
Lamotrigine

- Sodium channel blocker – antiepileptic drug

Negative side-effects of drugs

- Pain killers
- Statins
Painkillers

• Symptomatic treatment, avoid muscle relaxants and opioids

• 10% of pain is neuropathic due to dischernia and compression neuropathies – good effect of membrane stabilizing drugs
Post-polio syndrome, spinal cord injury and statin myopathy: double trouble or incorrect diagnosis? Two case reports.

Pathophysiology

- Persistent polio virus infection
  - Antiviral drugs
- Immunological factors
  - Immune-modulatory drugs
Immune-modulatory drugs used in PPS

- Cortison
- Interferon
- Immunosuppressants
- Immunotherapy
- Immune-globulins (IVIG)
Prior poliomyelitis-evidence of cytokine production in the central nervous system

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Figure 1

a) IL-4

No. of IL-4 mRNA expressing cells per 10^4 CSF-MC

b) IFNγ

No. of IFNγ mRNA expressing cells per 10^4 CSF-MC

c) TNFα

No. of TNFα mRNA expressing cells per 10^4 CSF-MC

d) IL-10

No. of IL-10 mRNA expressing cells per 10^4 CSF-MC

Legend:
- Cont.
- PPS
- MS
INF-gamma

\[ P = 0.00003 \]
Intravenous immunoglobulin for post-polio syndrome: a randomised controlled trial

Henrik Gonzalez, Katharina Stibrant Sunnerhagen, Inger Sjöberg, Georgios Kaponides, Tomas Olsson, Kristian Borg

Summary
Background Survivors of poliomyelitis often develop increased or new symptoms decades after the acute infection, known as post-polio syndrome. Production of proinflammatory cytokines within the CNS indicates an underlying inflammatory process, accessible for immunomodulatory treatment. We did a multicentre, randomised, double-blind, placebo-controlled study of intravenous immunoglobulin in post-polio syndrome.
Multicenter, placebo-controlled, double-blinded study including 142 post-polio patients
Increase of muscle strength

Treated + 4.3%

P < 0.05

Placebo - 5.7%
One year follow-up study
Gonzalez et al 2011
subm for publ

- Still significant decrease of cytokines

- Still significantly better quality of life for physical domains
2.5 year follow-up study
Gonzalez et al 2011 in preparation

- Cytokine levels?
- Clinical parameters back to base-line
Other studies

  TNF-alfa increase, effect on pain after 3 months.

- Fordyce et al 2008
  TNF-alfa increase correlated to pain, no intervention

- Bertolasi et al 2010
  RCT 50 patients – effect on quality of life - fatigue
Werhagen and Borg 2011
In press, J Rehabil Med

- 64 PPS patient treated
- 90 gram IVIG
Werhagen and Borg 2011

- Significant effect of IVIG

- 2/3 of patients had a decrease of pain (more than 10 units on VAS-scale)
Östlund et al 2011
In manuscript

- 160 patients
- 90 g IVIG
- Open study
- Evaluation after 6 and 12 month
Östlund et al 2011
In manuscript

- Statistically significant effect on Quality-of-life (SF- 36) at 6 month
  - Low vitality - effect
  - High vitality - no effect
Östlund et al 2011
In manuscript

- Responders
- Non-responders
- Negative responders
Summary

- The main treatment of post-polio syndrome is not pharmacological.
- Pharmacological treatment in post-polio is symptomatic.
- Lamotrigine and IVIG have given promising results regarding different effects in post-polio syndrome.
- IVIG have had effect on muscle strength, pain and quality of life.
- Pharmacological agents depressing muscle and pulmonary function should be avoided.
- Inform the anaesthetist before operation.
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