Post Polio Syndrome Pain Therapy

A supplement to the Power Point Presentation:
Schmerztherapie beim Post-Polio-Syndrome - *Post Polio Syndrome Pain Therapy*
by
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Abstract

A short pathophysiological summary of polio encephalomyelitis and post polio syndrome (PPS) in particular the fundamental peculiarities of pharmacological therapy with PPS. A general pain characterization serves as a transition to the occurrence of pain in PPS. The remarks on conventional pain therapy and its risks are seamlessly followed by pain therapy with cannabis, with special characterization of its pharmacological basics – followed by the conclusion that cannabis offers the possibility of complex PPS therapy beyond the level of chronic pain control.

I. Polio Encephalomyelitis

Without prior knowledge of polio encephalomyelitis specifics, the polio late effects: *the post polio syndrome*, cannot, in terms of its causal development, course and adequate therapy, be fully understood – in particular an adequate pain therapy, which would not be possible.

One of the best examples of a polio encephalomyelitis clinic is Canestrini's.

Canestrini, S.:
Betrachtungen über die klinische Symptomatik der Poliomyelitis (Heine-Medin) beim Erwachsenen. Zeitschrift für die gesamte Neurologie und Psychiatrie 1913, 20 (1): 585-628.
(Clinical features of poliomyelitis considerations (Heine-Medin) in adults.

According to CANESTRINI: The results of Canestrini's extensive casuistic case evaluations corresponding to the clinical symptoms both pathologically and anatomically show that all areas of the central nervous system were observed to have been affected by the polio disease.

Furthermore, the selected works by Bodian giving special consideration to the pathological anatomical findings should be mentioned:

Bodian, D.:
Pathogenesis of Poliomyelitis.
Am. J. Public. Health, Nations Health 1952; 42 (11): 1388-1402.

Bodian, D.:
Histopathological basis of clinical findings in poliomyelitis.
Am. J. Med. 1949; 6: 563-578.

According to BODIAN, the brain is always post-infectious and the spinal cord is usually structurally damaged. From a pathological point of view, all poliomyelitis cases are encephalitic, including the aparalytic, to which the in-apparent (asymptomatic), the abortive and the actual aparalytic course forms belong.

Works by NOETZEL et al., STAEMMLER and DREXLER also report that dorsal root ganglia are often polio damaged, thus even sensibility and sensory are not spared from polio related damage.
As a result, all areas of pain development, pain processing, and pain sensation can be affected poliotically as well as post poliotically.

II. Post polio syndrome as a late consequence of polio encephalomyelitis infection

Overall, PPS risk is about 30% for survivors of a polio infection with and without illness and about 80% for polio illness affected survivors.
In detail, BRUNO is concerned with the pathogenetic, symptomatic and therapeutic aspects of the post polio syndrome with significant reference to BODIAN.

As a result of the polio encephalomyelitis and post-polio syndrome considerations, the following conclusion emerges:

The post polio syndrome is an independent late-effect disease after a polio encephalomyelitis infection with or without clinical disease. It is a post viral physical, as well as psychological excessive demand syndrome, an incurable chronic progressive neurological disorder that, as far as we know, can affect almost all body functions, motor and neuro regulative, with the exception of the sensorium and intellect. The overstrain results from the polio related reduced and pre-damaged neurological structure under both normal and excessive functional requirements. It ends in a degenerative neuromuscular, as well as neuro regulatory functional and structural failure of the overloaded previously damaged or even compensated healthy areas, whereby even healthy areas under pathological control react pathologically, without even having undergone a pathologic structural change.

This may affect brain activity, motoricity functions, sensitivity, pain processing, temperature regulation, respiratory regulation, hormone regulation, stress regulation, cardiovascular regulation and emotionality.

Depending on the severity and frequency of their occurrence, fatigue, pain and muscle problems are foremost symptoms.

As a result of compensatory processes (compensation), polio related neurological damage of up to 50% nerve cell loss in a functional area remains invisible to the outside (subclinical, asymptomatic). As a result and depending on the extent of the pre-damage and regardless of the type of symptom whether subclinical or clinical, PPS may come into effect. The annual exacerbation rate is about 1%, and the trend is increasing.

Due to prior neurological and neuromuscular damage, there are special pharmacological risks regarding the usual side effects with PPS, both in acute and chronic therapy, because the drugs systemically affect a previously impaired function and structure. (see TRÖGER) This also applies to the pain therapy.

III. Pain

Pain is a subjectively unpleasant sensory perception, functioning as a warning signal in the case of actual or potential tissue damage. The diagnostic problem lies in the verification of reality and level of suffering as well as in the medical de-individualization (ÜBERALL) of the pain, between the differentiation of an affective (agonizing, torturous, paralyzing, terrible, violent, unbearable) and sensory (stabbing, oppressive, pulling, burning, tearing , boring) quality.

Types of pain are sub-divided as follows:

1. Nociceptor pain
   Harmful irritation of the pain receptors with inflammation.
2. Neuropathic pain
   Peripheral and central lesion or dysfunction of the nervous system.
3. Functional disturbance pain
   Pathological central pain processing without recognizable organic cause.
4. Mixed form pain.

5. Psychosomatic pain
Attention: ***This diagnosis is often given lightly!***

Differentiation between the types of pain
- acute pain
  with time limit in a warning signal function
- chronic pain
  of a long duration, starting as a warning signal with an independent tendency ***at a non proven warning loss!*** As a rule, it comes with a lowering of the pain threshold and is often due to multiple causes (multi causal).

Both forms require pain and cause control; in the case of chronicity, an integrative pain therapy may be indicated.

IV. PPS Pain

Pain of varying strength, type and character, constant or alternating, oppressive, stinging, tearing or burning, pulling or stinging, superficial or deep, are the most common symptoms by 79 to 91% of polio survivors with the post polio syndrome.

- muscle pain generally 38-86%,
- back pain 81%,
- joint pain 42-80%,
- shoulder-arm pain 77%,
- lumbar pain 75%,
- leg pain 75%,
- hip pain 67%,
- finger pain, hand pain, wrist pain, headache, neck pain, chest pain, knee pain, foot pain, whole body pain; strongest in lumbar area, shoulder-neck area, knees, legs, hand area and head.

The pain sensory disorders are in addition to the usually reinforced pain sensation, also less often a diminished sensation of pain.

Muscle pain is caused by central pain disorder, overload and 51% through mental stress. That should also apply to joint pains. Whole-body pain is similar to that of a flu-like infection and is due to general physical and psychological strain in a central pain regulation disorder. The triggering of headaches usually comes questionably from respiratory disorders and sleep disorders.

Polio encephalomyelitis and the post polio syndrome can result in both acute and chronic pain. Both can therefore be polio conditioned as well as post polio related. Usual and unusual pain with PPS is a consequence or concomitant symptom of a physically provable intangible tissue damage or nerve damage. A mental comorbidity is found only in exceptional cases.
Pain-related dysfunctions as well as the PPS itself are hard to certify, as they are usually combined with functional weaknesses.
PPS "relapses" are a chain of acute events and, outside of pain therapy, "causally" to be treated as such and given a chronical pain therapy.

Chronic pain in PPS is the result of persistent PM episodes and recurrent PPS episodes. These are not simply equated with the so-called chronic pain disease, but possibly in parallel with the latter.
Causes of pain are functional and metabolic overload, structural and mechanical overload and primary and secondary inflammation.
Attention: Different triggers for inflammation can be superimposed and thus strengthened.

V. Conventional pain therapy

Half a million patients in Germany suffer severe drug-related side effects each year. Especially the fight against chronic pain with conventional pain medicine, but also other long-term medications are often associated with significant side effects of death.
Estimates for Germany amount to up to 58,000 deaths per year from adverse drug reactions, from 2,000 to 7,000 through simple headache medication.

Patients on chronic analgesic treatment, for example, account for most dialysis patients, thousands of deaths from internal bleeding and up to two thirds of cases of acute liver failure.
In addition, thousands of suicides are attributed annually to inadequate pain therapy.

The following painkillers are used:
- pain inhibitors and
- anti-inflammatory

In the acute therapy – short notice use without any significant impact.
In long-term or duration-term therapy, shows a decrease in the effect on the pain until it becomes ineffective with an increase in side effects.

Side effects
All conventional painkillers, including antidepressants as co-analgesics, are health harming in the long term. For example, they may cause headaches, kidney damage, heart damage, liver damage, gastrointestinal damage, and others.
In neuropathic pain, they are often ineffective.

A selection of hundreds of examples of serious side effects shows its explosiveness in chronic pain therapy:
- ASS: gastrointestinal bleeding, kidney damage
- Paracetamol: liver failure
- Ibuprofen: gastrointestinal bleeding, heart attack, kidney failure
- Diclofenac: gastrointestinal bleeding, kidney failure, liver damage
- Amitryptilin (antidepressant as a co-analgesic): delirium, brain cramps, liver damage, heart muscle damage, nerve damage
- Opiates: respiratory depression, cerebral seizures, muscle stiffness, headache, physical dependency, no organ damage
- Naproxen: stomach bleeding
- Propyphenazone: breathing difficulties, shock, kidney damage
- Corticoids: corticosteroid myopathy

VI. Pain therapy with cannabis

Pain therapy with cannabis is still regarded as unconventional.
The fight against **pain** and **inflammation** is ostensible as in conventional pain relief.
Non-drug therapies are to be adapted as usual.

The use of cannabis in practice shows the following problem:
There is currently no positive development in the same direction between general authorisation, indication, reimbursement of costs and availability of finished medicinal specimens. The current widespread displacement of the medical cannabis application into illegality or to a rigid special status prevents or slows down its widespread medical use.

Therapeutics:
Sativex, Marinol (Dronabinol), Dronabinol, Canemes or Cesamet, Cannabis Flos (for example, Bedrocan), CBD oil.

VII. Therapeutic Cannabis

Cannabis contains numerous substances with a broad overall spectrum of very different medically relevant individual effects.

Ingredients:

> 600 known
Of it:
> 200 terpenes
> 100 cannabinoids
50 hydrocarbons
> 200 others

(see also Brauer, P .: Therapeutic Cannabis and Post-Polio Syndrome, Polio Europa aktuell 2017 No. 72, pp. 4-7.)

A cannabinoids (> 100)

CBD (Cannabidiol)
THC (Tetrahydrocannabinol)
CBN (Cannabinol)
THCA (Tetrahydrocannabinol Acid
CBDV (Cannabidivarin)
CBC (Cannabis Drug)
THCV (Tetrahydrocannabidivarin)

B terpenes (> 200)

Myrcene
Limonene
Linalool
Cariophyllen
Pinene
Terpineol
Nerolidol
Borneol
Eucalyptol
Humulene
3-Caren

C flavonoids

e.g., Cannaflavin A
Note :
Anti-inflammatory 30 times stronger than aspirin and twice as strong as cortisone

Spectrum of effect of the ingredients (> 600)

Important for PPS therapy:

- pain relief
- inflammation inhibition
- stress Inhibition
- muscle spasm inhibition
- nerve protection and construction
- improve attention
- improve concentration
- memory enhancement
- promoting sleep
- reassurance

Of importance beyond PPS therapy:

- bacterial inhibition
- cancer inhibition
- blood pressure reduction
- intraocular pressure reduction
- nausea inhibition
- fungal growth inhibition
- fear resolvement

Special features in the spectrum of action of the ingredients (> 600)

a) Synergism

Synergism = the same directional effect of different active substances with and without mutual enhancement or only the one-sided, or the mutual potentiation

Examples of synergism

ß-myrcene + THC = mutual reinforcement of pain inhibition
ß-myrcene + THCA = mutual enhancement of anti-inflammatory activity
THC + CBDA + THCA = mutual reinforcement of muscle relaxation

b) Entourage effect (combination effect)

The overall effect of a drug mixture is more than the sum of the effects of its individual active levels. For example, isolated CBD is less effective than in a cannabis extract with all cannabis ingredients.

Due to the synergism and the known entourage effect, ***natural extracts in complete form*** prior to the use of mono isolates, synthetics and semi-synthetics are therapeutically preferable.

Cannabis specimens

Sativex (Nabiximol - plant extract)
Marinol (Dronabinol - semi-synthetic THC)
Dronabinol (partially synthetic THC)
Flowers = Cannabis Flos (Bedrocan, Bedrobinol, Bedica, Bediol, Bedrolit Bedropuur)
Canemes (Nabilone - full synthetic THC derivative)
Cesamet (Nabilone - full synthetic THC derivative)
CBD oil (inter alia THC> 0.2% and CBD as plant extract)

Bedrocan

The variety Bedrocan comes from the Sensi seeds variety "Jack Herer". It is a 50% / 50% Indica-Sativa hybrid with the following proven ingredients:

THC: 18-23%
CBD: 0.03-0.2%
CBN: 0.00-0.03%
CBG: 0.6-2.2%
THCV: 0-0.3%
CBC: 0.01-0.12%
CBL: 0%
Linalool: 0-0.05%
Beta mycres: 0.1-0.3%
Alpha pinene: 0-1.0%
D-limonene: 0-0.9%
Beta Caryophylene: 0.01-0.4%

Cannabis side effects (a selection of the relatively common side effects)

headache
dizziness
nausea
breathing problems
fatigue
increased pulse
drop in blood pressure
dry mouth
red eyes
drop in intraocular pressure
muscular tension drop

As a rule, these side effects are absent or, depending on the dose, are only weak- / moderately distinctive, of a temporary nature and exhibit a tolerance development. Organ damage is not to be feared. Nevertheless, as with other medications, careful medical supervision is required!

Therapeutic dosage

- depending on the preparation
  from 1.0 milligrams to 30 milligrams per day in a creeping dosage
  superficially to combat chronic pain
- Cannabis Flos: from 0.05 to 5.0 grams per day in a creeping dosage
- CBD oil: start with a creeping in dosage of 1x3 drops daily, if necessary at weekly intervals until increase to 2x5 drops daily

Cannabis: the safest painkiller for chronic use!

CANNABIS can be a solution to several problems, depending on its spectrum of action among polio survivors.

Conclusion:

The medicinal effect of cannabis is not reduced to the effect of THC and not to the use for pain relief. Cannabis, with careful attention given to its various ingredients, offers the reasonable possibility of a complex PPS therapy in terms of anti-inflammatory action, pain relief, nerve protection, muscle spasm inhibition, attention, memory and concentration promotion and stress inhibition under medical supervision.

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