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Mechanisms for Hypertonicity

By Thomas Griner

Hypertonicity is enacted by reflex over-stimulation of the alpha motor nerves; four main reflex responses can be involved; three of these tend to be temporary and varied in nature, and are referred to as **dynamic** reflexes. They are:

1. *Guarding* reflex (pain driven/dynamic);
2. *Splinting* reflex (pain driven/dynamic);
3. *myotatic stretch* reflex

Even though the guarding/splinting reflexes are pain-driven, endorphins may block the pain from the conscious mind. The only perception of the guarding reaction is a feeling of weakness and/or stiffness, and splinting presents as a limited range of motion. This may or may not elicit conscious pain if an attempt is made to exceed the limit.
The fourth reflex is

4. *Internal organ* reflex (insensate to sensate); (deep muscles can also produce the internal organ reflex, as they are also insensate.)

This is a static reflex in that it is constant and unvarying, so the dynamic reflexes may add to this from time to time. The reason this maltonicity is static is that it is a disturbance of the mechanism that controls normal static muscle tone. Lactic acid, concentrated to a toxic level, disturbs the feedback to the cerebellum, which sets normal tone. The resulting overstimulation is thus more complex than simple reflex. The induced hypertonicity then creates a vicious cycle (positive feedback) by maintaining or even increasing the pool of toxic-level lactic acid.

A vicious cycle can be created by the internal organ reflex. The insensate organ or deep muscle tissue utilizes its neural connection to the superficial muscle to trigger conscious awareness, and it appears to be a two-way street; if that superficial muscle becomes irritable from hypertonicity, it in turn agitates the coupled internal organ or deep muscle. By this same process, whenever one of the dynamic reflexes induces temporary hypertonicity, some toxic-level lactic acid is trapped. This leaves a residual static reflex overstimulation, which accumulates with each episode.

The dynamic reflexes are simple spinal reflexes, so anything that can block their ability to stimulate the motor nerve can reduce the muscle reaction. However, so-called muscle relaxants act as indiscriminant spinal blockers, which helps explain some side-effects of such drugs. Hypertonicity in deep muscles excites the Renshaw inhibitory nerves, which also act to block the superficial reflex response without the usual drug side-effects, but with the usual effects of this form of tension.

As a side note, the â¯chillâ¯ (becoming chilled) is another dynamic reflex which can cause temporary hypertonicity. Although it is much milder than the other three dynamic reflexes, it can act as the "straw that breaks the camel's back" if it occurs in an area that is already heavily involved in muscular tensity. This is particularly true of people who allow their washed hair to air dry, which chills the infamous suboccipital muscles.

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