



AFT neuro diseases latest findings



Which is the horse and which is the jockey?

Let us share some interesting study findings and aspects on the relation of autonomic function and neurological disorders:

Neurological diseases are very often associated with autonomic dysfunction - or the other way round?

Migraine, Multiple Sclerosis or Parkinson's Disease are only a few examples for widespread and painful neurological diseases. Migraine, for example, has first been mentioned in 1,200 BC by the ancient Egyptians, who reported symptoms such as nausea, vomiting and fatigue related to painful attacks.¹ Perhaps this is the first evidence of an association of a neurological disease to autonomic dysfunction. Or is it the other way round: is it an autonomic dysfunction that drives a neurological disease?

"Not only do many patients with migraine suffer from symptoms of autonomic impairment, many patients with primary autonomic disorders also suffer from migraine.[...] It is still unclear which is the horse and which is the jockey in the painful race of autonomic dysfunction in migraine."¹

By now, a wide range of studies have dealt with the assessment of cardiovascular autonomic parameters in order to better understand what is going on in patients with neurological disorders.

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How can we evaluate the underlying mechanisms in migraine patients?

In their review, Miglis et al. from the Stanford University summarized several studies reporting reduced HRV in migraineurs. "Heart rate variability (HRV) is one of the most commonly utilized measures of autonomic balance, due to its ease of administration and noninvasive nature."¹ Further, orthostatic intolerance or even syncope are common symptoms associated with autonomic imbalance based on sympathetic and parasympathetic dysfunctions. Interestingly, "migraine is also quite common in postural tachycardia syndrome (POTS), affecting at least 25% of patients"¹.

Symptoms of autonomic impairment can show up in many different ways. Some are obvious, others

can only be assessed by closely investigating the interaction of the cardiovascular system with the autonomic nervous system by means of specific markers.

In order to find out which the horse is and which the jockey, the Task Force® Monitor (TFM) by CNSystems has proven a useful tool providing all necessary parameters continuously.

Noninvasive autonomic assessment in other neurological disorders

Having a deep understanding of autonomic mechanisms involved in neurological disorders may also help for a better treatment therapy of the disease. A recent study by Krbot Skorić et al. has shown that autonomic nervous system dysfunction is an important contributor to disease activity and progress of patients with multiple sclerosis (MS) and that “it has become even more relevant to early identify patients.”² They further hypothesize “a possible association between autonomic dysfunction and fatigue in people with multiple sclerosis” based on the assessment of heart rate and continuous blood pressure responses during the cardiovascular reflex tests.³

Another good example is the Parkinson’s Disease (PD), which is “a neurodegenerative disorder classically characterized by motor symptoms such as tremor, akinesia, rigidity, and postural instability.”⁴, but a range of various non-motor features resulting from dysautonomia has also become clinically evident, manifesting in e.g. orthostatic hypotension with postural dizziness, syncope, fatigue, muscular aching or reduced concentration ability.^{4,5}

According to Strano et. al cardiovascular autonomic impairment is a common, but “often overlooked feature of patients with Parkinson’s disease.”⁵ The aim of their recent study was the evaluation of the cardiovascular autonomic status and the cardiac functional capacity in PD patients. They assessed sympathetic and parasympathetic involvement through HRV, BRS and further markers and concluded that cardiovascular autonomic failure can occur in early state PD patients and that “this failure may have a negative impact on long-term cardiovascular outcome”.⁵

Fanciulli et al. studied supine hypertension (SH) in patients with PD and multiple system atrophy (MSA) being another feature of cardiovascular autonomic failure “that often accompanies orthostatic hypotension and may represent a negative prognostic factor [...] for survival, cardio- and cerebrovascular outcome as well as cognitive decline in PD and MSA.”⁶

Last, but not least Zawadka-Kunikowska et al. reported interesting results in PD patients when investigating the parameter Total Peripheral Resistance.⁷

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Comprehensive analysis required - innovative tools available

Although still quite complex and sometimes contradictory, these studies conducted with the Task Force® Monitor provide essential findings based on comprehensive analyses of different aspects and parameters related to the impact of neurological diseases on the autonomic nervous systems or vice versa.

Understanding the underlying interacting mechanisms is a declared aim of many clinicians for an easier diagnosis and more efficacious treatment and requires reliable, preferably noninvasive measurement tools, which are readily available on the market. One of the most widely used devices providing all relevant parameters in one work station is the Task Force® Monitor (TFM), described by Zawadka-Kunikowska as follows: “TFM calculates and registers biological signals in a completely reliable and non-invasive way, in the beat-to-beat mode, this being its main advantage.”⁷

Nevertheless, in recent literature the head-up tilt test has been considered a long-term procedure with limited specificity and sensitivity³ to detect all the different mechanisms which are responsible for a syncopal event. There is a claim for “new, more advanced methods for syncope analysis”³ that help to better understand the “complex responses provoked by the HUTT.”³ The authors agree that additional or different approaches and methods might be required and should be investigated.¹⁻⁴

[More information on CNSystems](#)

References:

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