Quantum Biophysical Semeiotic of Moya Moya Disease. Clinical Diagnosis of its Inherited Real Risk and Pre-Primary and Primary Prevention.

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Moyamoya disease is a progressive, occlusive disease of the cerebral vasculature with particular involvement of the circle of Willis and the arteries that feed it. The term moyamoya (Japanese for "puff of smoke") refers to the appearance on angiography of abnormal vascular collateral networks that develop adjacent to the stenotic vessels. The steno-occlusive areas are usually bilateral, but numeorus cases show unilateral involvement.

Blood vessel walls consist of 3 layers: the intima is the innermost layer; the media is a muscular middle layer; and the adventitia is the outermost layer. Separating the intima and media is the internal elastic lamina, an elastic membrane that is considered the outermost part of the intima.

Pathologically, Moyamoya disease is characterized by intimal thickening in the walls of the terminal portions of the internal carotid vessels either bilaterally or unilaterallly. The proliferating intima may contain lipid deposits. The anterior, middle, and posterior cerebral arteries that emanate from the circle of Willis may show varying degrees of stenosis or occlusion. This is associated with fibrocellular thickening of the intima, waving of the internal elastic lamina, and thinning of the media.(https://emedicine.medscape.com/article/1180952-overview).

A flurry of studies suggest that a metabolomics approach may be helpful in confirming Moyamoya Disease (MMD) and providing a better understanding of MMD pathogenesis. Elevated glutamine in the CSF may be associated with MMD pathogenesis, which was different from Atherosclerotic CVD (1-4). In my opinion, this studies underline the central role played by the genetic factor, suggesting a possible Inherited Real Risk also of MMD,

Unfortunately, none study allows physician to bedside recognize MMD, even in newborn, using a stethoscope. At my best knowledge, there is no research that talks about Inherited Real Risk of MMD both in the patient and in his (her) mother.

Aiming to bedside diagnose, i.e., with a stethoscope, Moyamoya disease Inherited Real Risk, present in 100% of mothers whose children are suffering from MMD, we have to consider its real angiological features.
Notoriously, MMD is a chronic progressive steno-occlusive disease of the distal internal carotid artery or proximal anterior cerebral artery and the middle cerebral artery with abnormal moyamoya collateral vessels without associated diseases. The disease has been increasingly reported due to the technological advances of diagnostic radiology and an increase of health check-up. The studies regarding the incidence, prevalence, natural

clinical course, disease progression, and surgical treatment outcomes have been increasingly reported (1-5).

Nevertheless, the precise mechanism of the disease still remains to be investigated further. In addition, heterogeneity of the ethnicity, different age at presentation, different degrees of hemodynamic compromise, surgical techniques such as direct bypass or indirect bypass surgery, and relative small sample size could lead to controversial results (5).

Quantum Biophysical Semeiotic and Clinical Microangiology help us to understand the pathophysiology and the course of the disease in the best possible way, starting from its Inherited Real Risk (6-15).
To comprehend the patho-phisiological mechanisms of QBS diagnosis of MMD, let's consider the following experimental evidence (7).

In health, digital pressure of mean intensity (700 dyne/cm.^{2}), applied on large artery (e.g., brachial artery) brings about simultaneously Microcirculatory Activation, type I, associated, in the distal, peripheral microcirculatory-tissue units.

Moya Moya disease bedside diagnosis is based on such a microcirculatory activation, brought about by carotid vessels and Willi's circle heritable stenosis.

1)The oculo-gastric aspecific reflex is pathologica: unilaterally to the disorder, after a Latency Time of 4 sec. (NN = 8 sec.) appears the gastric aspecific reflex, whose intensity parallels the seriousness of underlying disorder.

2) Antognetti's Sign, indicating CVD Inherited Real Risk or overt angiopathy, is present (16, 17).

3) Cerebro-gastric aspecific reflex during identical (700 dyne/cm.^{2}), digital pressure on brain trigger-points of diseased area (generally, frontal-, pre-rolandic-, temporal-areas) appears after a Latency Time of 4 sec. (NN = 8 sec.).

4) Brain Evoked Cerebral Potentials show a prolonged Latency Time (18).

5) Glycocalix Evaluation results pathological in the diseased neurons (19-24).

Interestingly, the woman, positive to the Inherited Real Risk of MMD, who wants to start the pregnancy, must first perform the RMQT, in the personalized form, aimed at eliminating the predisposition to the disease that can affect the newborn.

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