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Proceeding Paper

Restoration of arterial blood flow access to rhomboid fossa assists in left ventricular hypertrophy normalization

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Abstract: We have found a logical way to prove the mechanism that allows us to demonstrate the relationship between the restoration of arterial blood flow through the cervical vertebral arteries to the rhomboid fossa and the normalization of left ventricular hypertrophy. The human body is considerated like a dissipative structure. The process of restoration of the body should be considered as a redirection of energy flows from decay to restoration. It is also necessary to take into account the role of information about the availability of oxygen coming from the rhomboid fossa to the cerebellum. We plan to conduct animal studies and create a mathematical model of the system. This may accelerate the development of this theory.

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Introdution:

The recently announced CAAEBC theory, which explains NCDs (e.g. LVH) development through the loss of access to information about circulatory system to the rhomboid fossa raised some questions about correct way to prove it [1-3]. During LVH, the thickened heart wall can become stiff. Blood pressure in the heart increases Such deformations complicate the work of the heart. The heart is not able to pump blood with the necessary forceThe cause of hypertrophy of the left ventricle often becomes high blood pressure. Main methods of diagnostic: electrocardiography, echocardiography and MRI. Until recently, the relationship of brachiocephalic arterial blood [9-11] and AHT has been little studied and required theoretical consideration. In one theoretical analysis, there is a mention of the correlation between the AHT and the obstruction of blood access to the brain [12].

The left ventricular mass index (LVMI) is a diagnostic parameter for the identification of LVH, which is confirmed by the the European Association of Cardiovascular Imaging and American Society of Echocardiography.

LVMI = LV Mass / BSA
LV Mass = 0.8 x (1.04 x (((LVEDD + IVSd +PWd)3 - LVEDD3))) + 0.6

The parameters involved are summarised below:
LVEDD: Left ventricular end-diastolic dimension;
IVSd: Interventricular septal thickness at end-diastole;
PWd: Posterior wall thickness at end-diastole;

LVMI: Left ventricular mass index;

RWT: Relative wall thickness;

BSA: Body surface area using the Mosteller formula.

Upper normal limit of LVMI 95 g/m2 for women and 115 g/m2 for men [4]. Depending on this DVC can be eccentric or concentric. A concentric LVH is an increased left ventricular mass index (LVMI) with a relative wall thickness ≥ 0.45, while eccentric LVH - < 0.45 [11]. Concentric LVH can be found in patients with diabetes and oldster. Eccentric LVH can be found in patients with LVH can be found in patients with obesity or coronary artery disease [12].

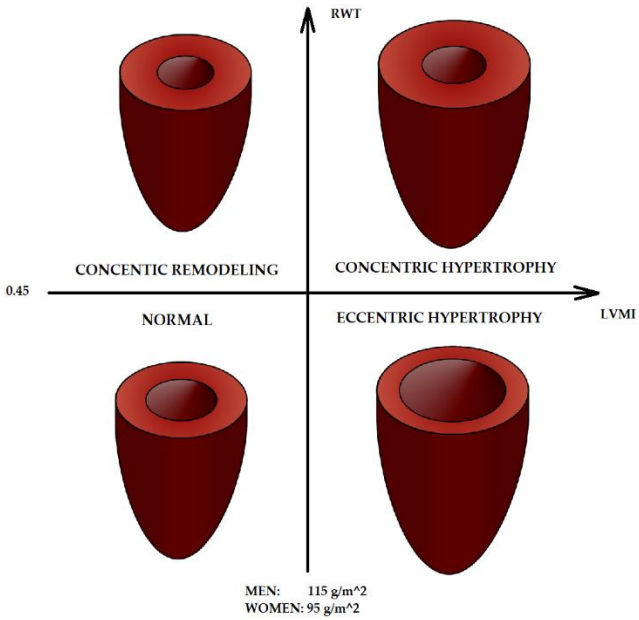

Figure 1. Geometric patterns of left ventricular hypertrophy.

According CAAEBC theory we says that the restoration of the above-mentioned access with the subsequent strengthening of the cervical muscular corset will lead to the recover of the main internal body functions. Recovery process we can observe by controlling corresponding parameters. Therefore, we need to set the acquisition of LVMI before the therapy and six months after its completion.

Prospective hypothesis verification

The general idea of experimental set is demonstrated on Fig.2.

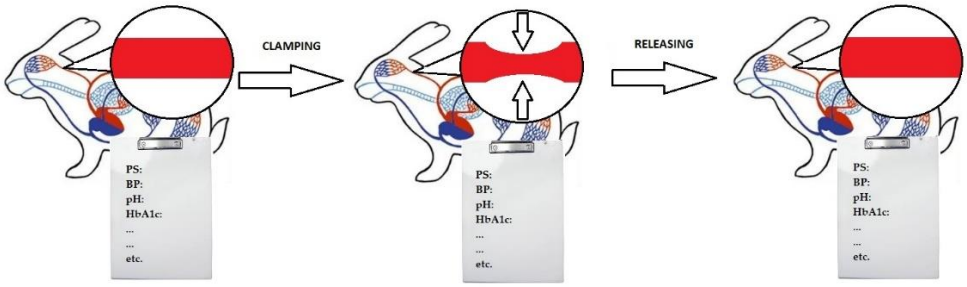

Figure 2. The animal model to check the CAAEBC applicability to AHT.

Discussion:

It is necessary to select an animal to collect statistical data. The animal must be chosen in such a way that the studied processes of vital activity of the organism correspond to the human body.

Table 1. Comparison of mammalian models on required to check CAAEBC parameters[5-8].

Model animal	Easy to transfer results to human clinical situation(s)	The absence of reserve arterial way to rhomboid fossa	Easy to measure blood pressure	Easy to boost blood for biochemical analysis	Esy to measure linear blood flow velocity through brachycephalic arteries
Mice	+	-	+	+	+
Rats	-	-	+	+	+
Rabbits	+	-	+	+	+
Minipigs	+	+	+	+	+
Goats	-	-	+	+	+
Sheep	-	-	+	+	-
Guiena pigs	-	-	+	+	+
Cats	+	+	+	+	+
Dogs	+	+	+	+	+

Since we underline, that the main feature of the animal model is the simplicity of the translation of the results to human clinical situations[13,14]. Very often it is so hard to choose the optimal model for a specific purpose, that it becomes necessary to select it after pilot experiment[15,16].

Let's consider the disadvantages of the (mini)pig. There are reports that this model can form collateral blood flow to duplicate vertebral arteries in the case of obstruction[17], but there is no information on cervical vertebral arteries. The main advantage of the minipig model to check CAAEBC is the similarity of the physiology and vascular anatomy to humans[18]. Namely for this reason (similar clinical situations apply to both in similar way) this model is so popular.

As about the dog and cats, these models exhibit the similarity in some extent to the arterial system in human, that makes more advantageous to our purpose, than e.g. rabbits for several cases of cardiovascular modelling[19-21]. But there are some issues in public attitude to use namely these models[22], therefore we will consider them as the last resort.

The rabbit as a model possesses a homosegmental blood supply from the abdominal aorta. It has almost no intraspinal collateral arterial system[21], that is an important advantage of such model. The main advantage is lower costs of keeping and easier manipulation.

The guinea pig model has more segmental blood. This is due to the small segmental arteries. This more segmental arterial supply provides impossibility to block blood access to rhomboid fossa that makes this model the least favorable to model CAAEBC.

For rats, the arterial blood supply demonstrates heterosegmental arrangement[9]. This fact is unfavorable as well as the highest dissimilarity with clinic situations from all models on the list.

The mouse model is similar to other rodent models[23]. In spite of all advantages of this model (the short times necessary for experimental symptoms to develop, low costs, and easy manipulation) we consider it improper for the same reason as rat. Knowledge

of the anatomy of cervical part of spinal cord vascular organization is extremely important to plan the proper experiment.

Conclusion:

The accumulated knowledge leads to:

- Development of a mathematical model to determine the correlation between LVMI and access to information about circulatory system to the rhomboid fossa
- Conducting an experiment on animals to collect a statistical data

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