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RELATIONSHIP BETWEEN ACUPUNCTURE HOLOGRAPHIC UNITS AND FETUS DEVELOPMENT; FRACTAL FEATURES OF TWO ACUPUNCTURE HOLOGRAPHIC UNIT SYSTEMS

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Chinese acupuncture-moxibustion is a therapeutic method for injecting or burning moxa (a kind of herb) on the acupuncture points (acupoints) of the body surface, used to treat diseases. There are over one thousand acupoints on the body surface. In the clinic, the acupoint system on the human body can be divided into two large parts: the channel system (macro-acupuncture) and the micro-acupuncture system. But the whole acupoint system can be divided into many different hierarchical holographic units. Such system possesses fractal structure [1].

We found that the acupuncture holographic units can be divided into two kinds. In one, their acupoints distribution graphs are similar to the shape of the human nerve-embryo; in the other these graphs are similar to the shape of a mature fetus.

In a 7-week old human fetus (nerve embryo 1.7 cm, 2g) its organ differentiation has already begun, as has its limb growth. Its 'body segment' development is very good. The whole nerve-embryo can be divided into many 'body segments'. Each of these contains a 'nerve segment' a dermatotome of skin (includes acupoints) and the corresponding organ. The nerve segments can control skin and organ in the same body segment.

The whole channel system is an acupuncture holographic unit. The course of the channels runs parallel with spinal column on the trunk. The acupoints in the channel are distributed at equal distances. The channel acupoints distribution possesses segmental structure. It has been found, in the anatomy results, that there is a good relationship between the acupoints distribution on the body surface and that of endings of the spinal nerves. The channel acupoints receive segmental innervation of spinal nerve. Although the extremities have no segmental structure, the channel acupoints on the extremity parts still receive segmental innervation of the spinal nerve. Therefore, the acupoints distribution and innervationn of the channel system retains the segmental structure. The channel system is an acupuncture holographic unit which is similar to the nerve-embryo.

The back acupoint system on the trunk is part of the channel system. It is an acupuncture holographic unit too. The acupoints distribution retains the segmental structure. Its acupoints receive segmental innervation of the spinal nerve. Thus, the back acupoint system is similar to the nerve-embryo.

There is the same micro-acupuncture system in each different hierarchical part of the human body [2]. The acupoints distribution graphs of these micro-acupuncture systems retain segmental structure. They are similar to the shape of the nerve-embryo. But the acupoints in these systems receive super-asegmental innervation.

On the other hand, in some acupuncture units, their acupoints distribution graphs resemble the shape of a fetus. It was found [3] that the acupoints distribution

graph of ear is just like an inverted fetus in a womb. The acupoints of organs originated from the same germinal layer (entoderm, ectoderm and mesoderm) are distributed over the same area in the ear. Te acupoints in the ear system receive superasegmental innervation of the nerve system.

The acupoints distribution graphs of the face- and nose-acupuncture systems are similar to the mature fetus, but there are deformations. These are copies of the shape of the mature fetus that are compressed along different direction with different proportion. The acupoints of face-and nose-acupuncture systems receive super-asegmental innervation.

There are many different hierarchical acupuncture holographic units of the channels on the extremity. Their acupoints distribution graphs are similar to the shape of mature fetus with deformation.

To sum up, the acupuncture holographic units can be divided into two groups: the acupoints distribution graphs either show similarity in shape to the nerve embryo or to a mature fetus.

It is well known that a self-affine system can be divided into many parts, each part is a copy of the whole which is compressed along different directions with different proportions. We have found that this concept can be used to describe the acupuncture holograpic unit system made of units similar to the shape of mature fetus. Each unit in this system is a copy of the mature fetus, which develops along different direction with different proportions. Their acupoint distribution graphs are similar to the shape of mature fetus but with deformations.

The tructure of a self-affine system generator T is

$$T(F) = S_1(f) \cup \ldots \cup S_m(f) \tag{1}$$

$$S_i(f) = \{A_i x + a_i : x \in f\} \tag{2}$$

$$A_i = a\ rotary\ matrix\ \times \begin{bmatrix} \lambda_i l & 0 \\ 0 & \lambda_i d \end{bmatrix} \tag{3}$$

in which $0 < \lambda_i l, \ldots, \lambda_i d < 1$. Here $\lambda_i l$ is a development factor of number i part of the whole, along the l direction. The change defined by Eqs. (2) and (3) is a self-affine change.

We have found that the concept of a self-similar system can also be used to describe the acupuncture system. This will happen if $d = 1$ in the above equations.

There is a close relationship between the acupuncture holographic units and fetus development. The fractal theory provides a tool to describe the two systems.

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