

COMMITTEE VI
Eastern Approaches to the
Unity of Spirit and Matter:
Qi and Science

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THE MERIDIAN AND QI

by

Yong-Tae Choi
Professor
College of Oriental Medicine
Kyung Hee University
Seoul, KOREA

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I. Creation and Classification of Qi

1. Creation of Qi

The Oriental regarded Qi as a key essential substance in forming Cosmos, and also, they recognized that every things are made by movement and changes of Qi.

In addition, they understood in the same way that an essential substance in forming human body was Qi, and that, life cycle and living activities were caused by such movement and changes of Qi as well.

Originally, Qi is immaterial substance. In origin of formation, Qi is classified into 2 major categories; "congenital" and "acquired case".

The former means essential Qi being preserved in reproductive system by receiving it from parents at the time when he/she was born, and the latter means Qi being formed by foods and respiration inhaling into lung when air in the atmosphere passes through respiratory tract of body.

The both congenital and acquired cases hold reciprocal correlation in the body each other, and, usually, Qi is given various names according to its distributional region or functional features.

The Yellow Emperor's Classic of Internal Medicine, which is the old book of Oriental Medicine, tells us that Qi is classified into 222 categories, and, in condition of Qi, it is classified into 142 kinds. The subject of acupuncture is the very adjustment of Qi, and so, it can be said that it is the most fundamental and meaningful task for us to examine such real subject of Qi.

2. Classification of Qi

As commented above, there are many kinds of Qi which have been recorded

in our Classics of Internal Medicine. However, Qi is classified into the following categories according to its origin of formation and function.

(1) Essential Qi or Pure Qi (原氣)

It is called "Essential Qi" for it develops from congenital sperm or spirit.

Essential Qi originates from kidney. As it contains Pure Yin (Qi of kidney yin) and Pure Yang (Qi of kidney yang), it is a most important fundamental Qi among others in body.

Essential Qi develops from congenital semen or spirit and it is preserved in kidney (reproductive organ) and it is constantly nourished and supplemented by essential energy of nutrition and it is distributed into whole body by Triple Energizer.

Viscera and Bowels and Meridians demonstrate their respective functions and maintain a normal growth and development. At the same time, Qi of 6 viscera and 6 bowels is produced on aid of Essential Qi.

Therefore, Essential Qi is a motive power of life cycle in body and it is a most essential material prerequisite to sustaining life cycle in body.

(2) Race Qi (宗氣)

Race Qi is produced by means of combination of respiration Qi coming into body through respiration and essential Qi of nutrition inhaling into body through gastro-intestinal system. Race Qi is one of Qi gathered in chest.

As Race Qi is exactly a origin of Qi to be formed in an acquired way, it is called "Race Qi".

As Race Qi is gathered in chest affecting cardiac and pulmonary function in a direct way and also affecting all other Qi of viscera and bowels, Race Qi allows a normal physiological condition.

(3) Nutritional Qi (營氣)

Nutritional Qi is developed from nutrient essential of water and grains and contains rich nutritions and circulates in blood vessels in entire body throughout and thus nutritional Qi helps normal functional demonstration of whole organs, covering 4 extremities externally and 6 viscera and 6 bowels internally at a time.

In another word, the nutritions denote Qi here.

Nutritional Qi circulates together with blood inside the vessel.

Blood and nutritions both do supply not only nutrient into entire body but also develop nutritional Qi transforming it into blood when so required.

As blood and nutritions both reciprocate with each other in inseparable co-relationship, it is sometimes called "Nutritional Blood".

(4) Protective Qi (衛氣)

Protective Qi in a good contrast with nutritional Qi develops from nutrient essential of water and grains and circulate outside the vessel in body. Protective Qi keeps skin warm and renders skin and hair glossy.

In addition, Protective Qi adjusts sweat glands and performs a

function of protecting against pathogenic factor of evil energy from environment. In consideration of the function, it is named Protective Qi.

(5) Qi of Viscera and Bowels (臟腑之氣)

Qi distributing to 6 viscera and 6 bowels namely, Liver Qi, Heart Qi, Spleen Qi, Lung Qi, Kidney Qi, and Stomach Qi is called Qi of Viscera and Bowels, which is a motive power of each viscera and bowel. That is, function and action of each viscera and bowels become a basic of Qi of Viscera and Bowels. Nutritional Qi and Protective Qi generate by Spleen Qi and Stomach Qi.

A mixed form of Qi of Nutrition and Protection and Environmental Energy is Race Qi. On the other hand, so-called True Qi (Pure Energy) is composed of Essential Qi, Race Qi, Qi of Nutrition and Protection and Qi of Viscera and Bowels in all.

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II. Qi Circulation and Its Function

Qi is a strongly active and fine substance of movement in body without a moment of halt. Qi constantly develops, moves and changes by means of inter-antagonism, inter-dependence, reciprocal acceleration and restriction. Qi is always present in the spot where 6 viscera and 6 bowels and 4 extremities and all meridian reach to.

This explains that all life cycle inclusive of each viscera and bowels movement in body is caused by Qi's circulation and change.

Besides that, one can say that one's body becomes healthy when Qi is full, weak when Qi is declined, comfortable when Qi is at ease, and disease occurs when Qi reverses. To simply put, Qi is a generative power of life. To summarize functions of Qi indispensable to upkeep life phenomenon as prescribed above, functions of Qi are as follows:

1. Propulsive Action

Circulation of Qi and Propulsive Action govern and control entire body from growth and development, physiological action and blood circulation of viscera and bowels and meridian even to distribution of body fluid or liquid and solid.

If Propulsive Action declines due to weak Qi, one's growth and development get retarded.

If functions of viscera and bowels and meridian become weak, then blood circulation and water metabolism become worse.

2. Heat Regulation

This means an action of Qi that allows maintenance of normal temperature of body. If the action of heat regulation is lacked or short,

one's body feels cold especially severely, and cold symptom of four extremities appears. When action of keeping a body warm goes excessive, then symptom of fever, heart-burn and the like appears.

3. Protective Action

Qi does protect skin and flesh of body and plays a role of preventing invasion of evil forces or pathogenic factors.

4. Astringent Action

Astringent action does control blood by preventing blood from flowing over outside the vessel, adjust discharge properly by controlling sweat and urine and prevent much excretion by controlling semen.

The actions confront against Propulsive action. If Propulsive action of Qi declines, blood circulation become unsmooth and stagnant blood occurs.

If Astringent action declines or reduced, blood flows out over outside the vessel and bleeding occurs. Therefore inter-restriction and adjustment are necessary there.

5. Energification

There are two meanings in energification.

First meaning is the case of showing a functional side of Qi representing a normal function of viscera and bowels.

Second meaning is the case of showing inter-reproduction stage between Qi, blood, sperm, liquid and solid.

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III. Application of Qi in the Oriental Medicine

1. Qi and Meridian

Meridian is the valuable achievements gained from the overall empirical data by the oriental fighting against disease since several thousand years ago. In a word, meridian, which is circulatory system of Qi and blood, is interpreted to be a reactive line shown by internal, pathological changes' being reflected on corporal surface by connecting meridian and internal organs of body. It was observed that abnormal sensation, such as sensory disturbance, dull and numb, pressure pain, etc., hardness, hematoma, abnormal dermal temperature, redness, etc. were shown in the concerned region where functional disturbance is made, thus establishing a therapeutic principle by which we can cure a disease by irritating or stimulating a certain region.

Meridian, which is fundamental element of life phenomenon, can keep its function by action of Qi and blood. In addition, meridian performs major internal correlation covering every directions, including internal and external, inside and outside, upper and lower, right and left of the body.

Furthermore, main stem and branches of meridian are distributed in the whole body, just like a network. Meridian is general term for main meridians, and collaterals. Main stem of meridian system are distributed longitudinally and located in deep part of the body relatively. Collaterals, branch of meridian system, are distributed latitudinally and located in surface relatively.

Meridians are related to 6 viscera and 6 bowels, which is classified

into hand, leg, yin and yang, etc. and there are 12 main meridians ,
 branch meridians derived from 12 main meridians, there are 12 divergent
 meridians and 8 extra meridians to assist main stem's function and also
 to perform a close correlation between viscera and bowels.

There are 15 connections in collaterals, and 15 connections are func-
 tioned to assist reciprocal correlation of 12 main meridians and
 reflexion between internal organs and corporal surface, thus expressing
 the body as an organic integrated system.

Each name of region forming meridian system is as shown below. (Table
 3.1-2, Fig. 3.1)

Table 3.1 Meridian System

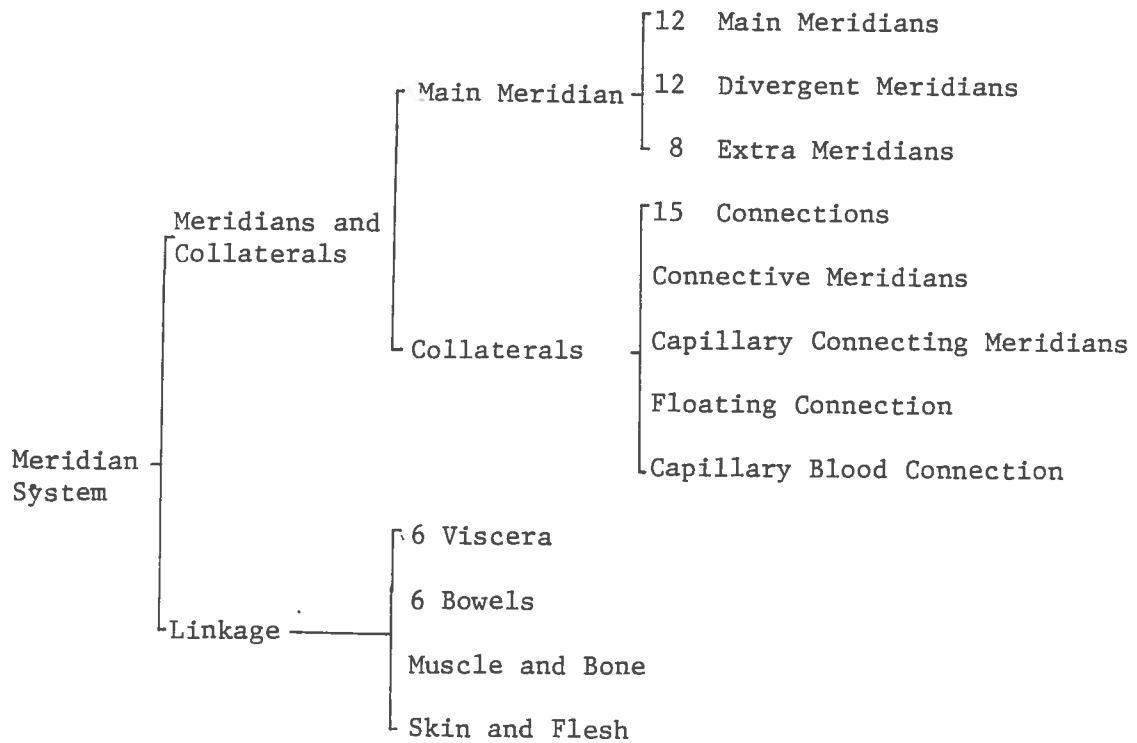
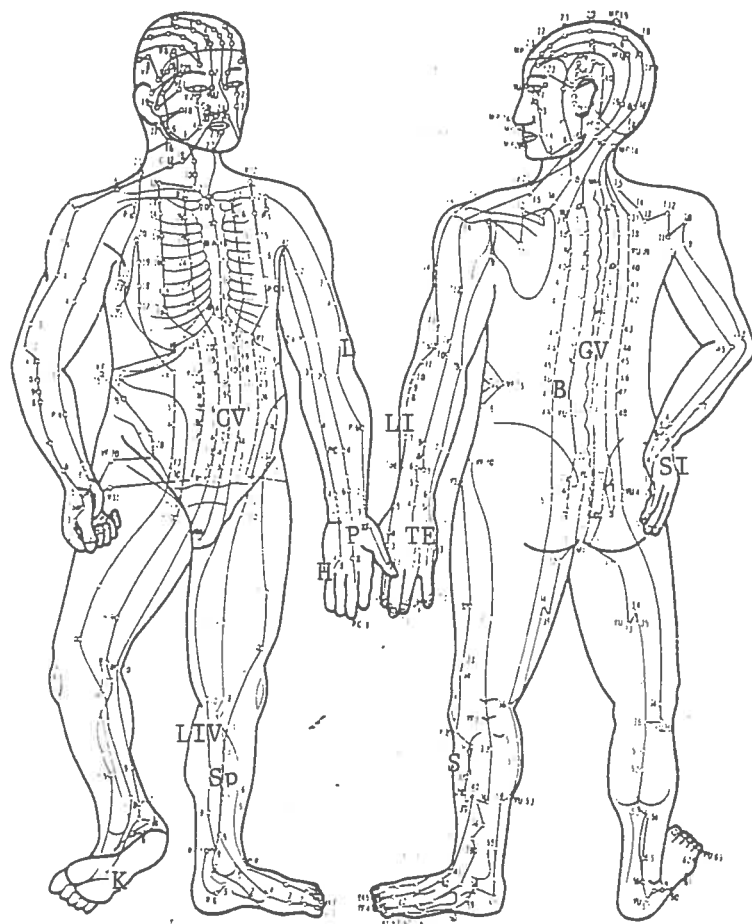


Table 3.2 Nutritional and Protective Qi and Meridian Circulations

Index Finger	Medial Side of Big Toe		Small Finger	5th Toe	4th Finger	Lateral Side of Big Toe					
	Lung Meridian (M)	Large Intestine M.					Stomach M.	Spleen M.	Heart M.	Large Intestine M.	Bladder M.
Lung	Nose		Chest		Medial Angle of Eyes	Chest	Lateral Angle of Eyes	Lung			



L : Lung Meridian
 LI: Large Intestine Meridian
 S : Stomach Meridian
 Sp: Spleen Meridian
 H : Heart Meridian
 SI: Small Intestine Meridian
 B : Bladder Meridian
 K : Kidney Meridian
 P : Pericardium Meridian
 TE: Triple Energizer Meridian
 G : Gallbladder Meridian
 Liv: Liver Meridian
 CV: Conception Vessel
 GV: Governor Vessel

Fig. 3.1 Meridians and Acupuncture Points

2. Meridian's Action

(1) Meridians' action is to let circulate Qi and blood in body and nourish body.

Physiological activity of viscera and bowels and normal functional maintenance of all organs like flesh, muscles, bones and 4 extremities rest with nutritious supply of Qi and blood.

That supply function is performed by Meridian System.

Here Qi includes Essential Qi, Race Qi, Nutritional Qi, Protective Qi and Qi of viscera and bowels.

Here Blood is same as various nutritional body fluid in body, which includes semen, blood, liquid and solid.

- (2) Meridian plays a role of reflecting or indicating any abnormality in body.

In case disease occurs in body, various abnormal change can be detected by carefully observing corporal surface and particular locus concerned where meridian reached to and by relying on pulsation or finger pressing, for meridian has special linkage with each part of body.

Reactive locus of corporal surface along with such abnormal indication serves for not only diagnosing diseases but also choosing selective acupuncture point on acupuncture treatment.

- (3) Meridian plays a transportational function of such pathogenic forces or of acupuncture and moxibustion and so forth.

Pathogenic forces infiltrating into corporal surface is transmitted to internal organs by meridian and again transmitted to other internal organs by meridian existing between internal organs. This phenomenon is called Meridian Transmission.

Stimulation arising from acupuncture needle or moxa applied to corporal surface causes affection to internal organs by meridian's transportational function.

To take an example;

We can note an increased gastric movement when acupuncture and/or

moxibustion be applied to Chocksamni(S36) located below the knees.

3. Qi Arrival (得氣) and Acupunctural Sensation Reflexion (鍼響)

It is said that all diseases are caused by unequilibrium state. Accordingly, acupuncture method is a medical treatment to treat or prevent various diseases by applying a fixed acupuncture stimulation on acupuncture point on the meridians of body.

However, Qi shall be concentrated the concerned region of acupuncture point when acupuncture insertion is made, and then, Qi arrival condition shall be made, so that target of medical treatment can be attained.

In a word, Qi arrival means a phenomenon in which practitioner feels tightness on acupuncture needle body when it twists its acupuncture needle after insertion of needle, and also patient feels sense of numbness (酸), swelling (脹), heavyness (重), tightness (麻), etc.

Accordingly, practitioner is request to understand closely whether or not such Qi arrival is made. In case Qi arrival was not made yet, practitioner is requested to twist its acupuncture needle on either side, or flicking it lightly, or apply a certain stimulation to affected region, so that Qi can arrive at the affected region. That is why practitioner can't attain its effectiveness of medical treatment until such Qi arrival is made.

Today, it is current situation that study and research on substance of Qi arrival is being progressed actively in each field.

Recent test on normal body reports us that they found the fact that there is a fixed rule in Qi arrival sensation of practitioner and patient and electromyomotive force of acupuncture insertion region.

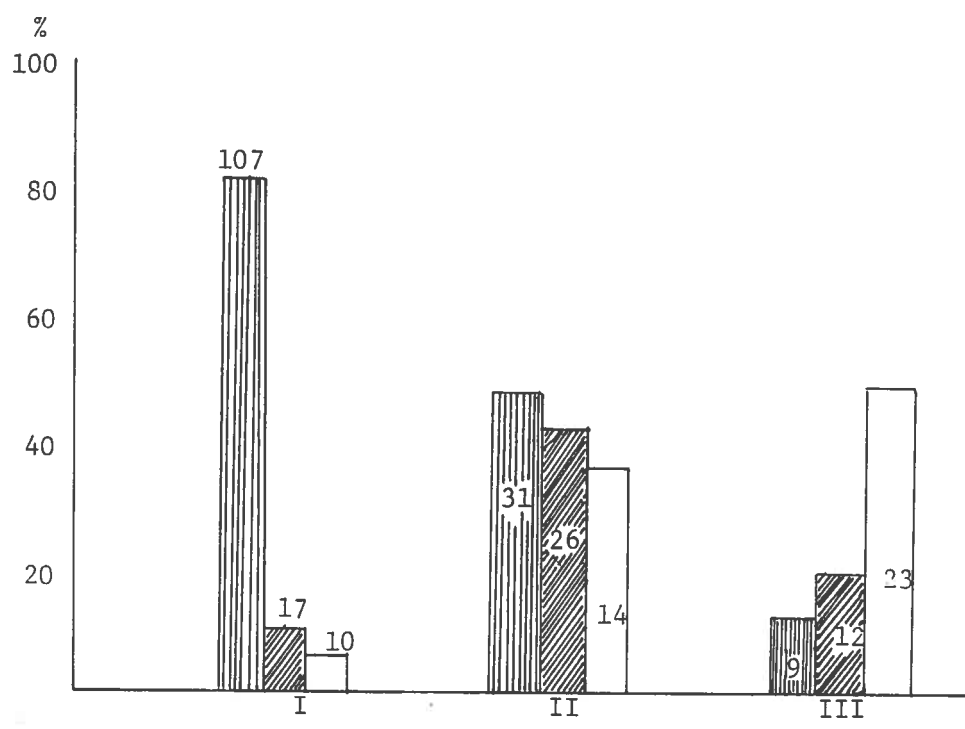



Fig. 3.2 Relationship between Qi arrival and EMG


I. High Qi arrival

II. Middle Qi arrival

III. None of Qi arrival

 High incidence of EMG

 Middle Incidence of EMG

 None of Indidence EMG

Number indicates numbers of acupuncture practice.

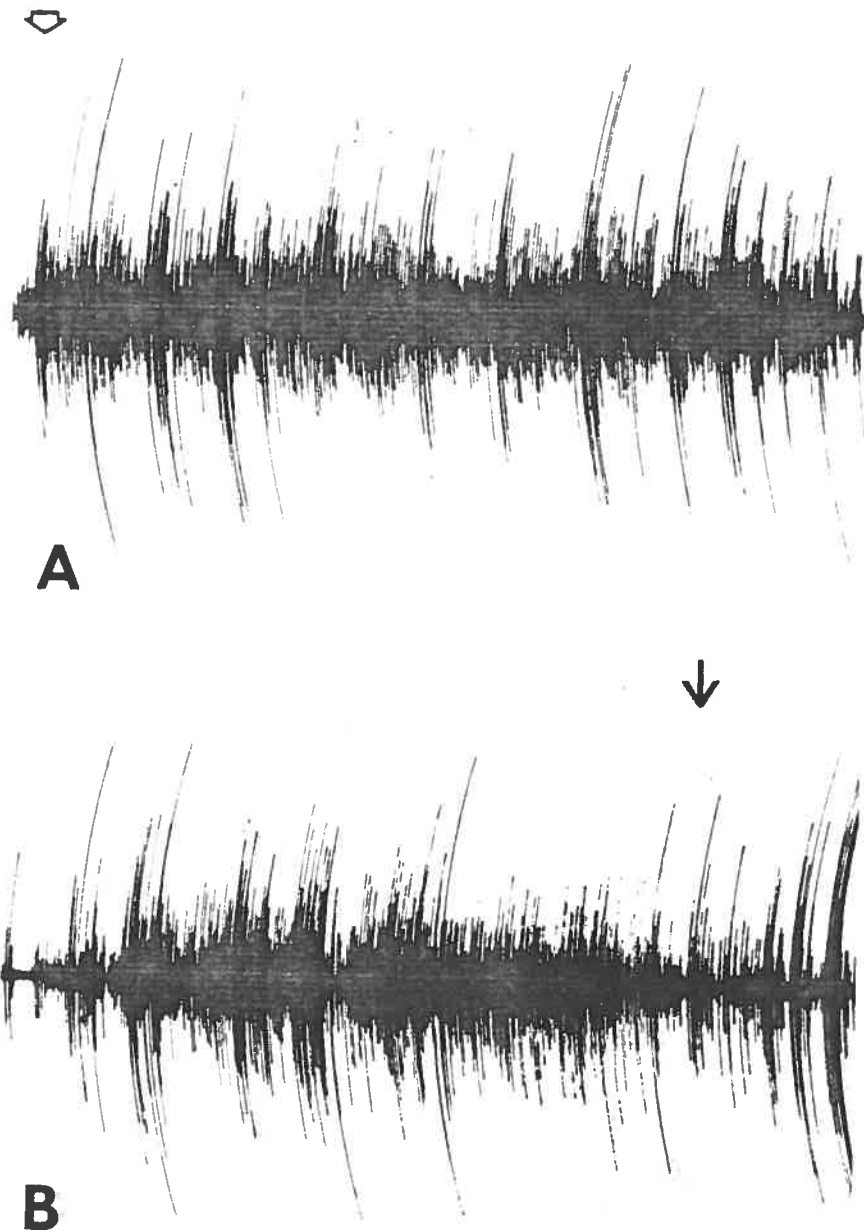


Fig. 3.3 Electromyogram recorded from anterior tibial muscle (S36) in rat before (A) and during (B) manual manipulation of acupuncture needle.

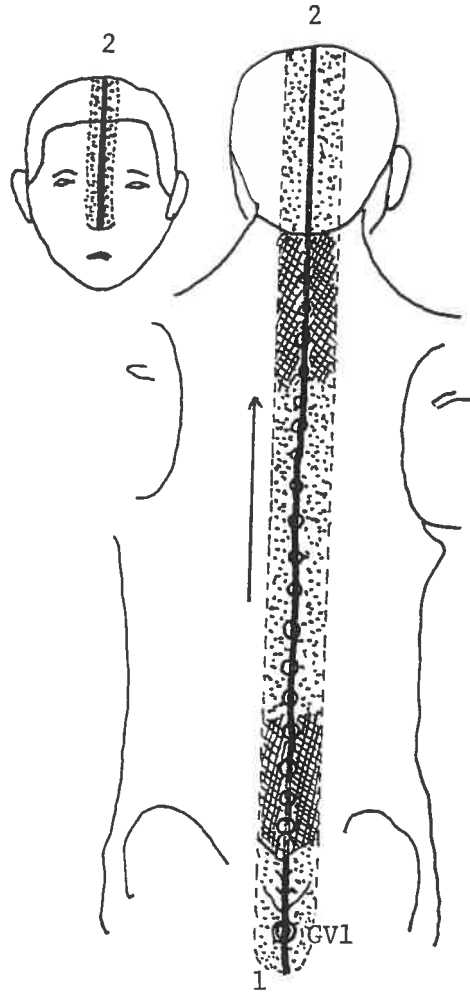


Fig. 3.4 Acupuncture Sensation Reflex of Changgang (GVI)

We could observe such phenomenon as tensive contraction of local flesh and muscle and attraction of acupuncture needle body at the moment when Qi arrival was recognized. In addition, we observed that, the more Qi arrival is induced, the more electrotonic contraction of muscle and flesh in electromyomotive force becomes expanded, and that, due to such phenomenon, acupuncture sensation has long been kept and strengthened, and then, such analgesic or therapeutic effect as expected was shown.

However, it is considered that induce factor for a Qi arrival is the very task for us to study and research more than ever through days to come.

Electromotive force of acupuncture point, which was commented above, is only yardstick for reflexing degree of Qi arrival under normal condition.

On the other hand, we could observe that, once Qi arrival sensation is obtained by acupuncture insertion, it became diffused up to distant locus along meridian, including local point.

Such phenomenon is made by twisting needle body on the manipulation when practitioner apply stimulation to acupuncture point by acupuncture insertion, which is called as "acupuncture sensation reflex".

In the end, acupuncture sensation reflex can be said to be a medium to confirm existence of meridian, thus proving that Qi is flowing along meridian. In addition, direction of diffusion for acupuncture sensation reflex.

In addition, our experiences proved that direction of diffusion for

acupuncture sensation reflex is not related to direction of twisting needle body, and that, practitioner can adjust direction of diffusion freely by needle tip.

Several case reports on acupuncture sensation reflex are as shown below.

- (1) Practitioner inserted acupuncture needle from Changgang (GV 1), parallel to vertebral column, tip of coccyx for the medical treatment of vertebral stiffness and pain, low back pain, unable to walk, etc. which are the major symptoms for patient of spinal caries, and then, stayed acupuncture for 15 minutes and applied stimulation every 3 minutes. In this case, acupuncture sensation reflex passed anus and rectum, and then, passed Baekoe (GV 20) along Governor Vessel which is a meridian, and finally, a reached up to tip of nose. In addition, the above mentioned symptoms were resulted in the favorable turn for better. (Fig. 3.4)
- (2) For patients complaining Palpitation, feverish eyeball, shortage of breath, heavy headache, etc., practitioner inserted needle in Shinmun (H 7) which is acupuncture needle point for Heart Meridian. In this case, acupuncture sensation reflex has radiated to 5th finger tip, Sohae (H 3) of elbow joint, Nogung (P 8) of palm of hand, Hapkok (LI 4) of dorsum of hand. (Fig. 3.5)
- (3) For patients of pain of lower extremity and knee joint arthritis, practitioner left acupuncture needle in Choksamni (S 36) of their stomach meridian for 20 minutes.

In this case, acupuncture sensation reflex was found to be radiated to the whole stomach region through abdomen, along route of stomach

meridian, toward regions of 1st and 2nd toe and knee joint.

(Fig. 3.6)

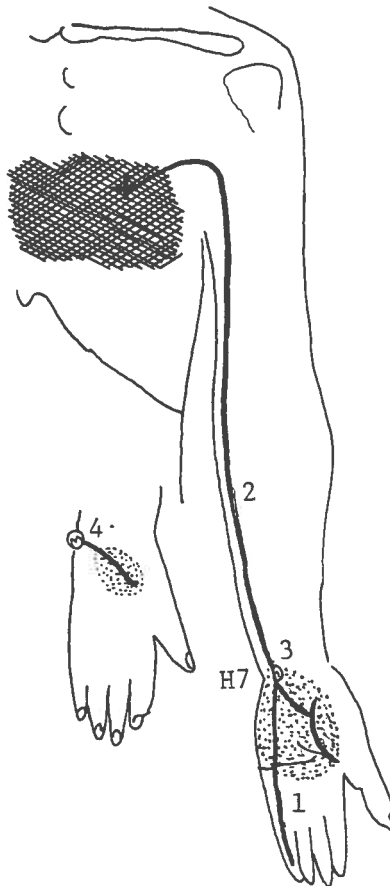


Fig. 3.5 Acupuncture sensation reflex of Shinmun (H 7)

Furthermore, a study report tells us that, in case of inserting needle in Kollyun (B 60), acupuncture sensation reflex was radiated along the concerned Bladder Meridian, while it was radiated along Gall-bladder meridian in case of inserting needle in Kuho (G 40). In addition, some study reports also tell us that, as



Fig. 3.6 Acupuncture sensation reflex of Choksamni (S 36)

result of inserting needle in the region of sacral pain, acupuncture sensation reflex was radiated along the concerned Bladder Meridian, and that, practitioner could attain the efficacy of medical treatment for the concerned disease.

In addition, another test report on healthy adult male of 20 - 45 age group told us that, in case of inserting needle directly in Lung meridian of patient, 39% of patients felt

sensation at needle point, and 61% of patients felt centripetal or centrifugal acupuncture sensation reflex.

The same study report tells us that, in case of inserting needle directly in heart meridian, 52.1% of patients felt a local sensation of acupuncture stimulation, and 47.9% of patients felt centripetal or centrifugal acupuncture reflex.

Especially, the reactions of Taeyon (L 9) of Lung meridian and Sochung (H 9) of Heart meridian were found to be the most remarkable. So, it is presumed that such needle points may be sensitive regions where Qi is most concentrated.

On the other hand, study and research on conduction velocity (rate) of acupuncture sensation reflex has been made so far. Some reports tell us that, in rapid case, acupuncture sensation reflex transmits 15 - 48cm per second, and 1.5 - 2.5cm per second in late case. By contrast with it, some reports tell us that, nerve conduction rate transmits 3 - 4m or up to 300 m per second in rapid case.

Considering the above study results, it well proves that acupuncture sensation reflex and nerve conductivity are not same one, and also, acupuncture sensation reflex, which is Qi arrival, is transmitted along each meridian, and the subject of acupuncture sensation reflex is the very "Qi".

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IV. Phenomena of Qi and Meridian

Biological features of meridian, which is passage for Qi, and several examples on efficacy of medical treatment for various diseases are as follows:

1. Electro-characteristics of meridian and corporal surface.

What is the substance of meridian? How about formation of meridian?

How is meridian transmitted? Today, study and research on such questions have been made by many scholars. As a part of such study and research, many study reports in which they compared electrodermal characteristic on index, to examine phenomena of acupuncture point by objective means have been released so far.

In such study, they named low point where electrodermal resistance is below $100K\Omega$, as good conductive point, when they contacted conical electrode of contact surface of 1 mm^2 with corporal surface, and then, they got well conductive line which connected such points systematically, and they examined whether or not it is coincided with meridian.

Namely, they found that index indicating diseases of internal organ and diseases caused by other factors is they very well conductive line, by making good use of principle that myotonus is contracted and excretion of subcutaneous fat is promoted by irritation of sympathetic nerve in corporal surface.

In the Oriental Medicine, meridian or acupuncture point is reactive locus of functional pathological changes of internal organs, and meridian point is much coincided with good conductive point in its distribution.

In addition, they measured dermal electric resistance at acupuncture point before/after inserting acupuncture needle, and then, compared its increase and decrease. Then, it was found that electric resistance was much more decreased at acupuncture point than non-meridian point.

Thus, acupuncture point is much coincided with region where dermal electric resistance value is at low level, in electric characteristic.

(Fig. 4.1)

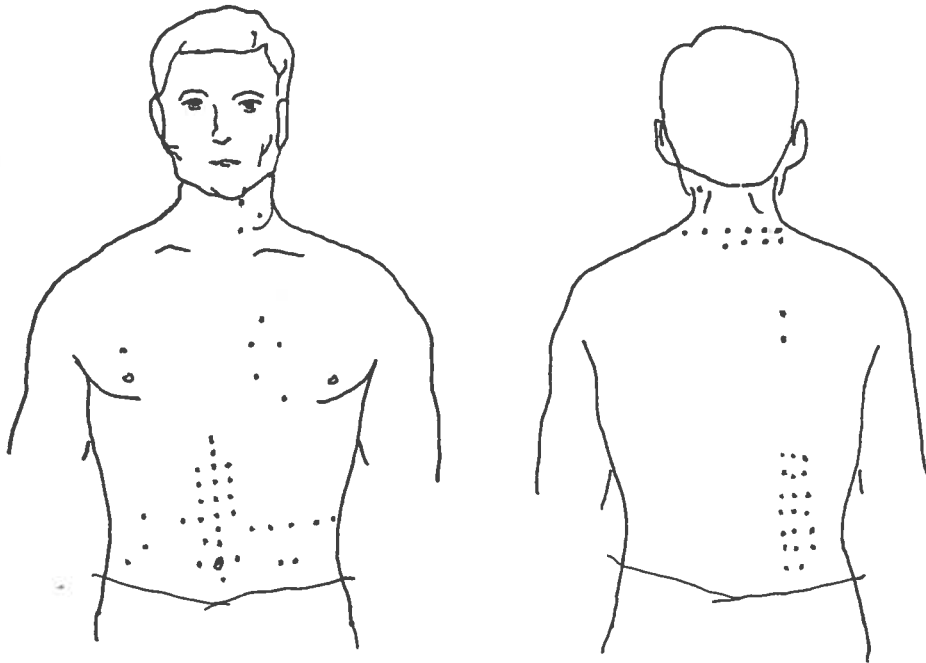


Fig. 4.1 Examples of good conductive points, like acupuncture points, in healthy adults.

2. Meridian and Thermogram

Here we have one method to observe thermogram by measuring dermal temperature of the body, as one of method for studying characteristic of meridian. Namely, thermography is designed to show dermal temperature of the body, generally representing circulation of Qi and Blood.

As result of measuring thermogram at chest-abdomen of healthy adult, 1°C higher thermogram locus was observed. These high temperature striation and locus is reflexing vessel status of artery system. Generally, it was observed that location of such locus' is similar to that of chest-abdomen alarm point showing physiologic, pathological condition of 6 viscera and 6 bowels (Fig. 4.2)

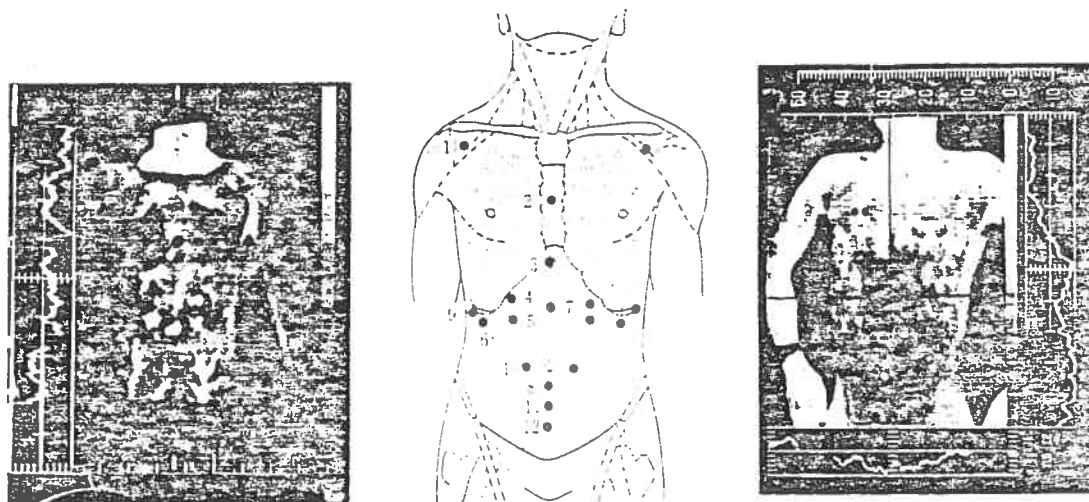


Fig. 4.2 Acupuncture points on chest-abdomen and its thermogram.

In addition, such high temperature striation and locus show high reactivity at acupuncture locus, and also, show good efficacy of medical treatment. Thus, these results will be a good material enough to certify functional characteristic of acupuncture point.

3. Effect of acupuncture point stimulation on various functions in the body
 - (1) We inserted acupuncture needle in Taeyon (L9) and Choktaek (L5) of Lung meridian on 30 children of bronchial asthma, and then, performed oscilloscopic analysis for it. As result of such our

analysis, it was observed that conditions of 63% patients showed a tendency of being taken favorable turn for better. In a word, it is a case in which we treat diseases of bronchus located in chest by operating acupuncture point situated in upper extremity and wrist joint, and also, it can be concluded that such case is a medical effectiveness which was made by transmitting of Qi arrival. (Fig 4.3)

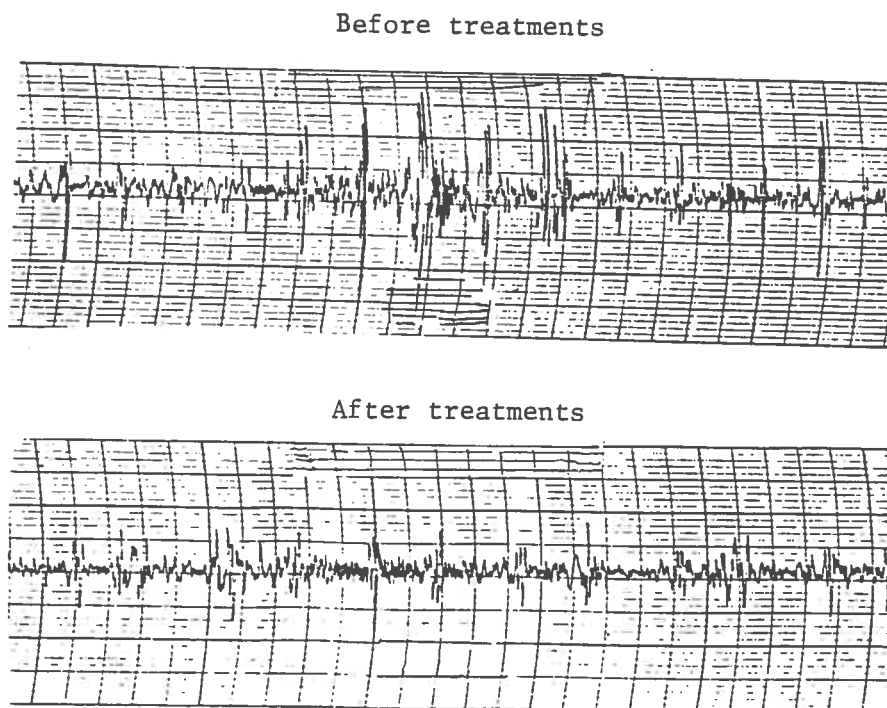


Fig. 4.3 The Change of Noise Level before and after Acupuncture

- (2) We inserted acupuncture needle in Shinmun (H7) and Taenung (P7) located at wrist joint, among pericardium meridian and heart meridian, on healthy adults at their twentieth and patients, for the purpose of observe effects of acupuncture insertion on blood

pressure. As its result, it was observed that, in case of patient who was inserted acupuncture needle in Shinmun (H7), the maximum systolic pressure dropped up to 19 mmHg in average, and also, in case of patient who was inserted acupuncture needle in Taenung (P7), the maximum systolic pressure fell down up to 14 mmHg in average. In addition, we measured electrocardiograph, respiration curve and pulse wave of digit, in case of applying acupuncture on patients of cardiac disease, and its result was that symptoms of such cardiac disease showed tendency of taking a favorable turn for the normal conditon. Such our results prove that local acupuncture stimulation has effect on the whole body, regardless of left and right, and, as its result, it also has effects even to circulatory system. (Fig. 4.4 & 4.

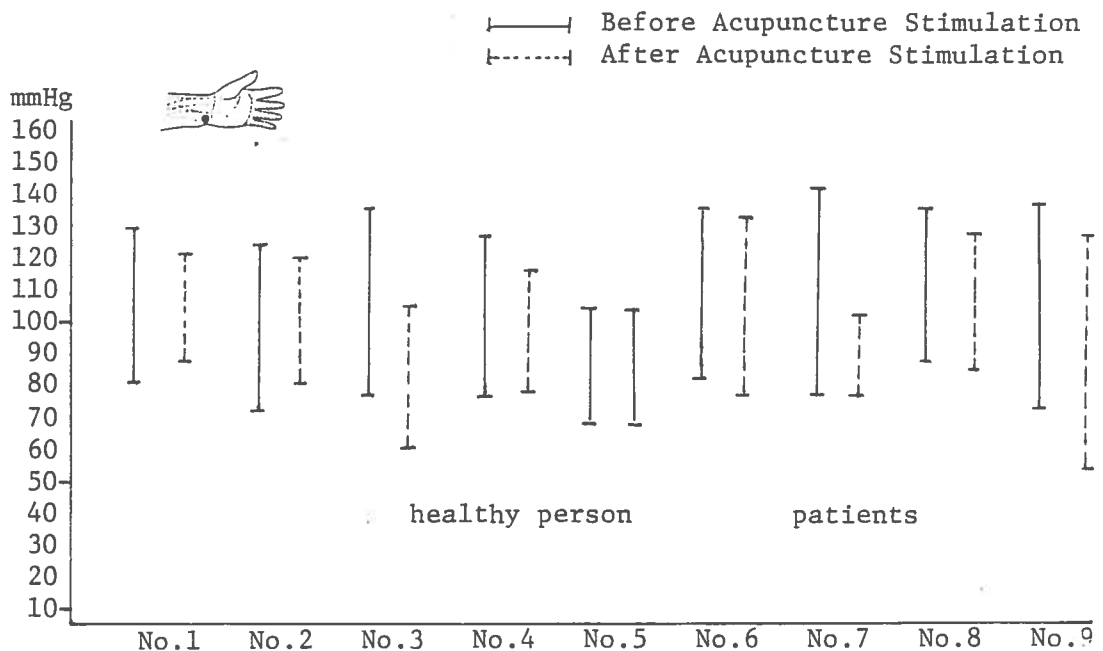


Fig. 4.4 Effect of Acupuncture to Shinmun (H 7) on the Blood Pressure.

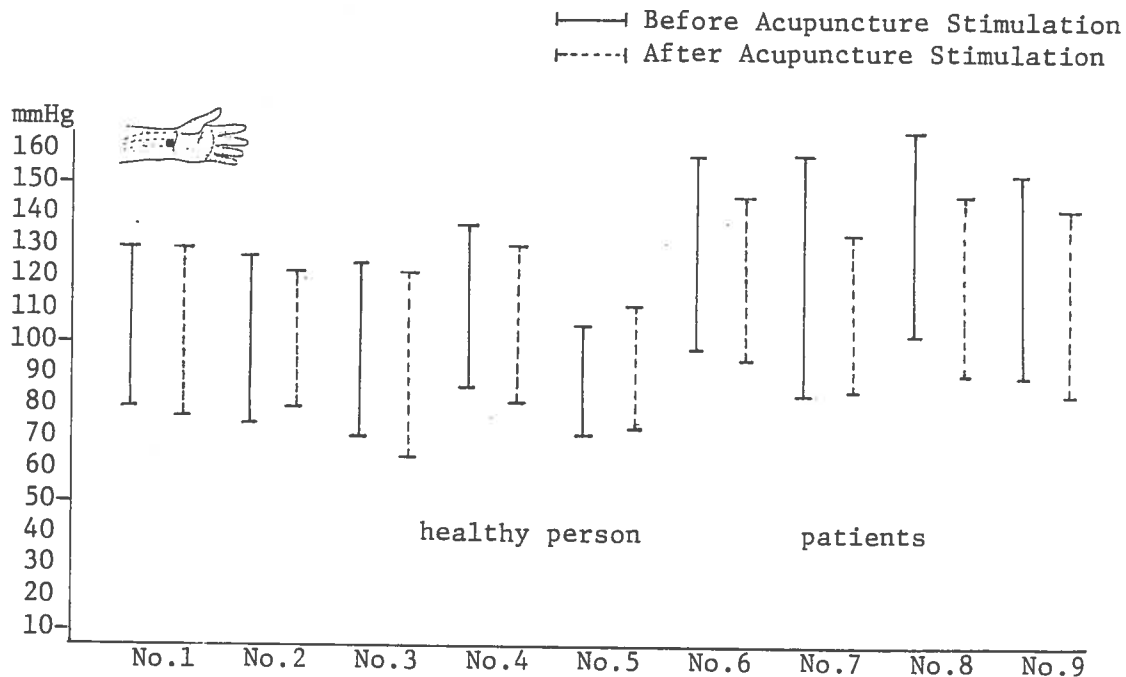


Fig. 4.5 Effect of Acupuncture to Taenung (P7) on the blood pressure.

(3) We experimented amount of hepatic blood flow as an index to for the purpose of observing changes of blood circulation of internal organs by stimulating corporal surface. We conducted our experiment on healthy adult (male) at 21 - 30 age group, and, in acupuncture points, we took Kimun (Liv 14) of Liver meridian and Kansu (B 18) of Bladder meridian, and we conducted moxibustion and electroacupuncture respectively and separately. We used radioisotope method for inspection. First, we calculated fractional clearance K value, and then, we took it as index for amount of hepatic blood flow.

Results of such our experiment were that sudden decrease of amount of hepatic blood flow was shown. Considering such results, it is presumed that acupuncture stimulation brings up vasoconstrictor due to sympathetic nerve, and so, phenomenon of decrease of amount of hepatic blood flow. Thus, this fact is proving a functional relationship among viscera and bowels, meridian and acupuncture point. (Fig. 4.6)

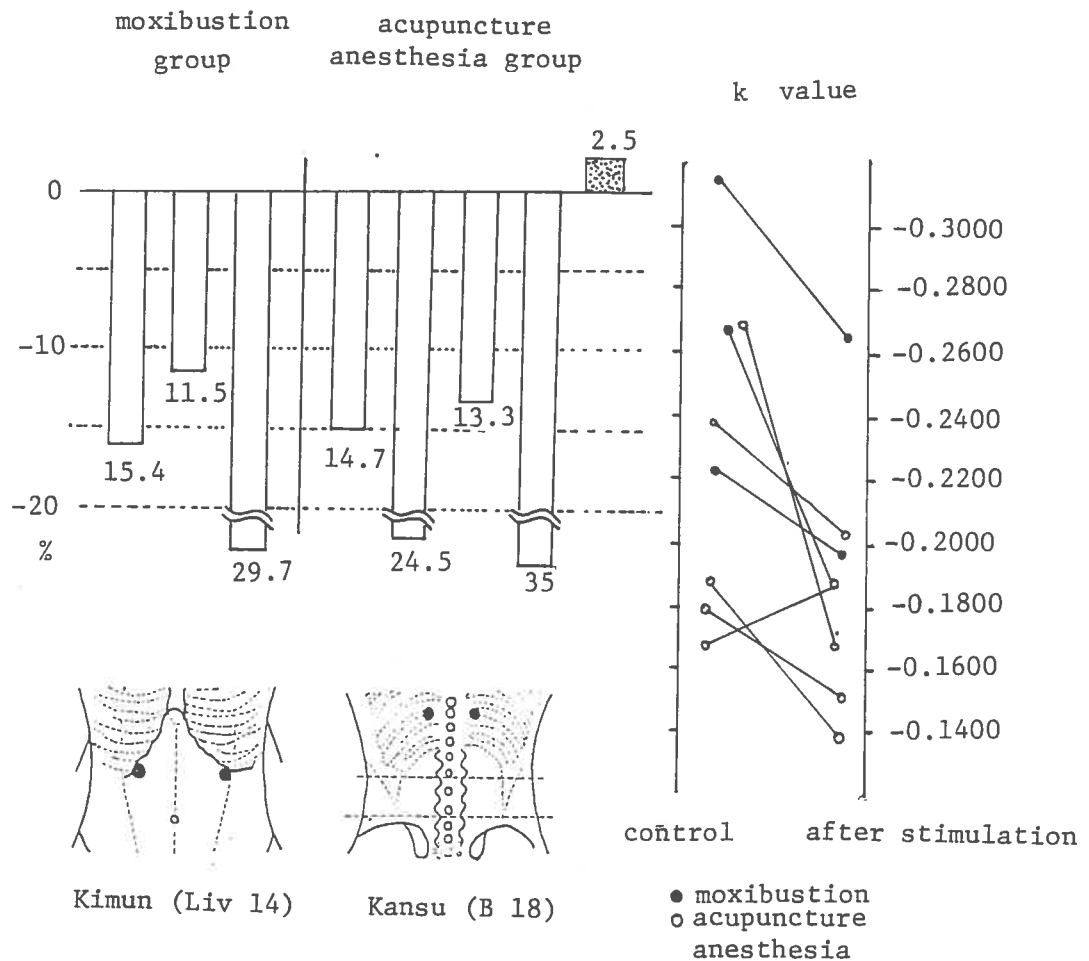


Fig. 4.6 Changes of hepatic blood flow after acupuncture to Kimun (Liv 14) and Kansu (B 18).

In addition, many study and research on relationship between meridian and internal organs have been reported. Considering such all experiement results, we can understand easily that application of acupuncture needle in acupuncture point, which is local area on corporal surface, is aimed at inducing Qi arrival, and that, the concerned diseases can be cured by activating functions of belonging, viscera and bowels or organs of the whole body by Qi arrival sensation, along meridian line.

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V. Conclusion

From the Oriental Medical point of view, term "Qi" is with material concept and functional concept. Based on congenital Qi possessing from time of birth and acquired Qi to be continuously supplemented with food taken or respiration, various forms of Qi, including Race Qi, protective Qi, Nutritional Qi, Qi of viscera and bowels, etc. are formed, then organizing an integrated system of "the human body" in material aspect.

Furthermore, Qi in functional aspect is being circulated in the whole body as motive power continuously through the meridian system. So, once such circulation is suspended, it was recognized as "lifeless".

Accordingly, even acupuncture treatment based on meridian theory is aimed at attaining harmonized circulation of Qi first of all. Namely, in case that unequilibrium of Qi is brought up in the body due to a certain disease, it is basic principle for acupuncture treatment to apply external Qi by inserting acupuncture needle in acupuncture point on the concerned meridian to secure interrelation between external Qi and internal Qi, thus inducing equilibrium of Qi.

Therefore, practitioner is requested to induce so that Qi arrival can be made without fail, when practitioner apply acupuncture insertion. In this case, acupuncture sensation comes to reach viscera and bowels, organs and tissue which are target area, along the concerned meridian line, to help smooth action of Qi. In the

In the end acupuncture point, which is acupuncture moxibustion stimulation point, is just like a well where most Qi gather together, and connecting line of such acupuncture points is the very meridian.

Today, many hypothesis on "What is the substance of meridian?" have been presented by many scholars, but, it is current situation that we fail to reach a fixed conclusion yet.

It is very difficult for us to examine the true nature of Qi and meridian which is immaterial existence. However, we are confident that the main body of meridian will be appeared before us in process of pursuing for its co-factor by approaching to phenomenon of meridian without benting on finding out cause of meridian's action.

