The Development of Acupuncture in Eastern Medicine

Dr Chen Han-Ping

Part 1
The Progress of Acupuncture Study in recent years in China

First of all, I will briefly introduce the development of acupuncture research in China in recent years under the following 5 headings:

2. Research on traditional manipulation methods and moxibustion.
4. Research on the nature of meridians.
5. The clinical application of acupuncture anaesthesia and research on the principle of acupuncture anaesthesia.

The clinical application and curative effect of acupuncture

Nowadays, acupuncture and moxibustion as the main therapeutic methods, can treat over 300 common diseases. Among them, curative effects have been obtained for at least 10 diseases. Research on acupuncture treatment of infectious diseases, such as viral hepatitis and acute bacterial dysentery, as well as surgical infections, has shown that acupuncture has the effect of enhancing the body resistance.

Moxibustion to the point Guanyuan (Ren 4) can be used to treat shock caused by blood loss. Research on acupuncture treatment for giving up smoking, schizophrenia, hyperthyroidism, Hashimoto's disease and so on, has enlarged the realm of application of acupuncture.

Many clinical studies not only preserve and develop the peculiarity of traditional Chinese medicine, but also combine with basic research and emphasise the importance of using modern science and technology. For example, research on the acupuncture treatment of coronary heart disease and the pathological changes of the diabetic urinary bladder and the use of acupuncture to regulate cardiovascular functions provides dependable experimental evidence for a curative effect.

Research on traditional manipulation methods and moxibustion

In the research of manipulation methods, advanced equipment, for example, thermal imaging systems and infra-red photography, has been applied. The results of observation indicate that different methods of reinforcing and reducing can make the curved line of vessel volume in the limbs produce up and down changes correspondingly. In addition, such new advanced instruments as the laser needle, the lower frequency electric therapeutic apparatus and the microwave needle have also been used in clinical practice successively. Research on moxibustion indicates that it can regulate the functions of the immune system.

Research on meridian theory and principle of acupuncture effects

Researchers in our country have recorded the propagated sensation lines along meridians in 170,000 subjects up to now. The new charts of 14 meridians were completed according to the results of this determination. The new charts show that the propagated sensation lines along meridians are fundamentally similar to the old charts. Arrival of the sensations at the corresponding visceral organs might induce changes of the functional activities of that organ. The result of this research has confirmed that the arrival of Qi to the affected area could bring about the clinical effects of acupuncture.

Researchers used cutaneous resistance, electric potential, sound messages and cold light to survey the meridians and found related specific changes along the meridians. Many researchers studied a variety of factors which influence the propagated sensation lines along meridians and confirmed some important characteristics, such as the propagated nature of sensation lines along meridians and the effects of excitation and block of the propagated sensations.

Research on the nature of meridians

Some scholars in China have put forward such theories as "dispersion of central excitation", "excitation of action factors in the periphery" and "the equilibrium" and so on, on the basis of observation and experiment. These theories have been paid attention to by others at home and abroad. The recent research on the principle of acupuncture effects confirmed the regulatory effect by acupuncture on various functions of the body has the properties of bi-direction and integrity. As a result, acupuncture can be used to treat many diseases in various systems.

Clinical application of acupuncture anaesthesia and research on the principle of acupuncture anaesthesia

In the last five years, the application of acupuncture anaesthesia has become less, but the research work on acupuncture anaesthesia is greater than before. Operations on the thyroid gland, the cervical vertebrae by the anterior approach and tooth extraction etc., under acupuncture anaesthesia, have been widely used in our clinics. Caesarean section und
Acupuncture anaesthesia has become a commonly used anaesthetic method in obstetrics. The results of research on the principle of acupuncture anaesthesia have shown:

1. Acupuncture analgesia is closely related to the functional activities of the cerebral cortex and thalamus.
2. Acupuncture can excite many kinds of receptors, which produce signals of needling stimulation. These signals, together with painful signals which are located in the different levels of brain and spinal cord, can affect each other.
3. Acupuncture can influence the functional activities of the raphe nuclei, nucleus accumbens amygda and caudate nucleus as well as the thalamus.
4. Endorphins play an important role in acupuncture anaesthesia.

### Part 2

#### The effect of Acupuncture on Immune Function

The term "immune" was first seen in "IMMUNE CLASSIFIED PRESCRIPTION" in the eighteenth century. In ancient medical books, there are records of the treatment of rabies, using the brain of rabid dogs. In the Ming Dynasty, the method was put to use in the prevention of smallpox, using the smallpox scabs of infected individuals. In the treatment of rabies, using the brain of rabid dogs. In the 7th century it was emphasised in "GENERAL TREATISE ON THE CAUSES AND SYMPTOMS OF DISEASES" in the Ming Dynasty, Li shizhen introduced the method of preventing measles with placenta hominis (dried powder of human placenta and umbilical cord) in his "COMPENDIUM OF MEDICINE".

In the 7th century, it was emphasised in "THOUSAND GOLDEN PRESCRIPTIONS" that "2 or 3 points on the body should often be moxibustioned", which suggests that acupuncture and moxibustion may have an active effect on the immune function of the human body. Since 1958, the theory and technique of immunology has been used in the studies of acupuncture and moxibustion, and a lot of data has been collected.

The effects of acupuncture on humoral immunity

(i) Specific humoral immunity

*After giving an injection of pertussis vaccine to rabbits, electric needling and manual needling were respectively administered near the median nerve. 15 days after the injection, the titre of bacillus pertussis agglutinin in the sera of the electric and manual needled rabbits was much higher than that of the control group.*

The same result was obtained by moxibustion on the points Dazhui (Du 14) and Baihui (Du 20). After injecting sheep blood cells (SRBC) into the rabbits, the existence of anti-SRBC antibodies could be prolonged by daily needling on point "Zushanli" (St 36), and the antibody level was 2 to 3 times higher than that of the control group on the 7th day. The bactericidal power of the sera to staphylococcus aureus could be strengthened by acupuncturing the "Chengshan" point (UB 21) of the rabbits.

(ii) Nonspecific humoral immunity

Needling point Zushanli (St 36) in the human body or rabbits can remarkably increase the production of pro-ophin and opsonin. Performing acupuncture on normal people or patients with chronic diseases at points Zushanli (St 36), Quichi (LI 11), Zhongwan (Ren 12), Weishu (UB 21), or moxibustion on points Zushanli (St 36); Dazhi (Du 14) etc., increased the level of complement. The level was lowered, if it had been high before treatment. Histochemical changes were found in the axillary lymph nodes. Forty-eight hours after needling, the plasma cells increased rapidly.

Clinically, acupuncture can treat a variety of inflammatory diseases such as bacillary dysentery, appendicitis, chronic cystitis, bronchitis and hepatitis, etc. It also has a noticeable effect on the incidence of post-operative infection. Recently, anti-inflammatory therapy with acupuncture has had its use expanded from acute chronic inflammation and from superficial inflammation to those of the viscera.

Acupuncture does not affect inflammation through direct treatment of its cause, but through needling acupuncture points to enhance the natural immunity of patients and thereby repress the focus of inflammation.

Humoral factors, especially the immune factors, play an important role in the anti-inflammatory effects of acupuncture. For instance, needling points Zushanli (St 36), Dazhui (Du 14), Tianzhen (ST 25) and Quichi (LI 11) of the human body increased the level of immunoglobulins in most patients. This effect lasted for as long as 3 to 4 days. The serum IgG and IgM level of most hepatitis patients which had been higher than normal before treatment, showed a tendency to return to normal after acupuncture therapy, thus improving the state of illness.

After acupuncture treatment, the total serum complement and immunoglobulin levels of patients who suffered from acute bacillary dysentery, were strikingly increased. When electric acupuncture was performed at points "Hangjuxu" (ST 37), and "Qingwen" (AT 25) in rabbits and when patients with acute bacillary dysentery were treated with acupuncture on two occasions, it was found that the ability of the plasma to kill dysentery bacilli was greatly enhanced from 30 minutes to 3 hours after treatment. The serum lysozyme levels of the patients suffering from acute bacillary dysentery rose significantly 3 days after acupuncture treatment. The lysozyme levels of patients whose conditions were improved and whose culture of faeces became negative, was lowered, but the levels of the patients whose faecal culture remained positive tended to rise. The SgA level in the faeces of dysentery patients without pus and blood stool was lower than that of the normal people. After acupuncture, it gradually returned to normal with the recovery of the disease.

In a certain hospital, 1383 cases of acute bacillary dysentery treated by needling the points Tianzhen (ST 25), Hegu (LI 4) and Zushanli (St 36) were observed. 1264 cases were cured, with an average recovery time of 5.4 days. The culture of faeces became negative in 86.5% of cases.
The effects of acupuncture on cellular immunity

(i) Total count, differential count and phagocytosis of the white blood cells

Administering acupuncture to normal subjects at points Zushanli (St 36), Neiguan (P 6) and Hegu (LI 4) made their total white blood counts rise from 105 to 243% of the original levels. It has been pointed out that the effects of acupuncture on the white counts of the patients are variable in pathological states. For instance, when acupuncture was performed at points Zushanli (St 35), Shenmen (HM 7), Taiyuan (Lu 9) and Sanyinjiao (Sp 6) etc., most patients' white count and neutrophil granulocytes increased and lymphocytes decreased, but those of a small number of patients showed the opposite. It was also found that the level of neutrophil granulocytes, which had originally been high, lowered, and vice versa. Similar effects can be obtained by moxibustion.

The leucopenia brought about by radiotherapy in cancerous patients could be improved to some degree by performing moxibustion at points Zushanli (St 36), Dazhui (Du 14), and Pishu (UB 20). 20 cases of nasopharyngeal cancer who had received radiotherapy were treated by acupuncture, the points were: (1) Hegu (LI 11), Qihai (Ren 6), Zushanli (St 36), Xuanzhong (GB 39); (2) Waiguan (ST 5), Guanyuan (Ren 4), Yinglinquan (Sp 9), Taichong (Liv 3); (3) Dazhui (UB 11), Shenshu (UB 23) (with cutaneous acupuncture method). The immune functions of the treatment group (radiotherapy plus acupuncture) and the control group (only radiotherapy) were measured before and after radiotherapy. The result showed that the tuberculin reactions of the treatment group were remarkably enhanced. This suggests that acupuncture has the effects of regularising the immune function of the body. But it cannot protect the lymphocytes from the radioactive lesion.

Acupuncture also affects the phagocytic power of leucocytes. Administering acupuncture on normal subjects at points Zushanli (St 36), Hegu (LI 4), Neiguan (P 6), Quchi (LI 11) and Laowei (Extra 33) or the median nerve could augment the phagoidindex of leucocytes in phagocytising staphylococcus aureus and bacillus pestis. This effect reached a peak 24 hours after needling. The phagocytic power of the neutrophil granulocyte of acupuncture treated patients suffering from acute bacillary dysentery was significantly enhanced compared with that in the drug control group.

(ii) Reticuloendothelial system

In order to show the functional state of the reticuloendothelial system, trypan blue, Congo red ink and "32" labelled pigeon red blood cells were injected intravenously and the state of their disappearance from the blood was observed. When acupuncture was administered at points "Dazhui" (Du 14), "Baihui" (Du 20), "Pishu" (UB 20) and "Ganshu" (UB 18) in dogs, or at "Hegu" (LI 4), "Zushanli" (St 36), "Dazhui" (Du 14), "Transhu" (St 25) and "Ganshu" (UB 18) in rabbits, or at "Dazhui" (Du 14) and "Mingmen" (Du 4) in rats, it could be seen that the phagocytic power of the reticuloendothelial system was enhanced. The same result was obtained by morphologically observing liver sections of rabbits which had received an injection of trypan blue after needling. Six to twelve days after electric-needling the rabbits the phagocytic power of the reticuloendothelial system of the electric-needling group was strikingly strengthened in comparison with those of the control group. We also gained the same result by giving moxibustion to rabbits and guinea-pigs at points "Zushanli" (St 36), "Hegu" (LI 4), "Quchi" (LI 11), "Taocao" (Du 13), "Baihui" (Du 20) and "Dazhui" (Du 14). Moxibustion of guinea-pigs infected with tubercle bacilli enhanced the phagocytic power of the monocytes and macrophages.

(iii) Lymphocytes

The lymphocyte transformation rate (LTR) of hepatitis patients was compared before and after acupuncture. It was found that the LTR of the patients rose remarkably after needling. This indicates that acupuncture has effects on cellular immune function.

In addition, after acupuncture, the patients' leucocyte adherence inhibition index, leucocyte phagocytic rate and active rosette-forming rate returned to normal if they were higher than normal before treatment. Little change was found after acupuncture if they were within normal limits before treatment.

In some patients, T suppressor cells and T helper cells were measured. The changes of the Ts cells and the Th cells before and after acupuncture treatment indicated that acupuncture has some effects on the stable regulation of T cells. The active rosette-forming rate of hepatitis patients who were effectively cured with acupuncture rose remarkably in comparison with that before treatment. The rosette-forming rate which was higher than normal before needling returned to normal after needling. The fact that the Th cell level which was higher than normal and the Ts cell level which was relatively lower before acupuncture returned to normal after acupuncture indicates the acupuncture can change the subsets of T cells which take part in immune regulation.

During acupuncture anesthesia, after 20 minutes E-rosette forming cells and lymphocyte transformation rate increased for 24 hours. Drug anesthesia had no such effects. It suggests that acupuncture can raise cellular immunity of the body, but there also have been opposite results reported.

The lymphocyte transformation rate of 30 patients undergoing gastrectomy was observed in Shanghai College of Traditional Chinese Medicine. The LTR of 18 cases became low after needling at points Zushanli (St 36) and Shangjuxu (UB 22) with acupuncture manipulation. These 30 patients submitted to gastrectomy under acupuncture anaesthesia, during which the LTR decreased and the serum corticosteroid level increased. This seems to indicate that the low LTR after acupuncture anaesthesia is related to the increased corticosteroid secretion which comes from operation trauma.

In summary, acupuncture and moxibustion can enhance the function of T cells and also increase the total white count, total serum complement and the levels of immunoglobulin. All this provides a theoretical basis for the clinical effects of acupuncture on inflammation, its anti-viral and anti-pyretic action and its ability to heal the focus of infection.
Effects of acupuncture on allergy

Experimental allergic encephalitis (EAE) was produced by immunizing guinea-pigs with preparations of brain stem. Acupuncture was administered daily at point "Quichi" (LI 11) or "Zushanli" (St 36) and the effect compared with a control group. The results showed that acupuncture could accelerate the pathological progress and aggravate the symptoms. After final injection, the toes of the guinea-pigs in the needling group swelled noticeably in comparison with those of the control group, and necrosis of the toes happened only in the needling group suggesting that acupuncture can enhance immune reaction.

Clinical observation showed that needling point Renzhong (Du 26) has the effect of anti-allergic shock, which has already been confirmed by animal experiments. JCK inbred line mice were sensitized with bovine serum and the final injection was given on the 17th day. The mortality rate was 75%, which could be reduced to 26.2% if acupuncture was used at points Renzhong (Du 26) and Chenjiang (Ren 24) at the time the allergic shock occurred.

The effects of different needling methods on the immune function of the human body

72 healthy adults were randomly divided into two groups (30 subjects for each group). Filiform and microwave needling were performed respectively to compare the differences between the two groups and thereby to explore the effects of filiform needling and microwave needling on the T cells of the human body. Microwave needling is an acupuncture method which combines microwave technique with acupuncture. After acupuncture sensation was felt, the needle handles were covered with spiral microwave antennae to induce the local sensation of warmth or numbness. The needles were retained for 20 minutes. The points needed for the two groups were the same (left Hegu (LI 4) and right Zushanli (St 36)). Before and after acupuncture, peripheral T cells of the two groups were counted under the same condition. The result showed that filiform needling could raise the T cell rate in blood significantly. There was no noticeable change in the microwave needling group after acupuncture.

The effects of different moxibustions on human immune functions

49 cases of asthma and 21 cases of dermatosclerosis were respectively treated with festering moxibustion and drug-partition moxibustion, and the changes of LTT (lymphocyte transformation test) and E-RFC (E-rosette forming cell), IgG, IgA, IgM and C3 were observed (Shanghai Research Institute of Acupuncture and Meridian). Both asthma and dermatosclerosis belong to yang-deficiency according to the differentiation of signs and symptoms of TCM. For the former and the points chosen were: Dazhui (Du 14) and Feishu (UB 13), and for the latter the points were: (1) Dazhui (Du 14) and Shenshu (UB 23). (2) Mingmen (Du 4) and Pishu (UB 20). (3) Qihai (Ren 6) and Xuehai (Sp 10). (4) Geshu (UB 17) and Feishu (UB 13).

After treatments of festering moxibustion in 2 months, the LTT and E-RFC levels became much higher than before moxibustion treatment. In 11 out of 26 cases of asthma, where the LTT and E-RFC levels which had been lower than normal before treatment, the levels returned to normal after moxibustion treatment. If the levels of IgG, IgA, IgM and C3 had been in normal range before moxibustion treatment, no obvious change was observed afterwards, but if they had been either lower or higher than normal, they could be changed in varying degrees, with statistically significant difference before and after moxibustion treatment. The LTT levels of all the 21 patients with dermatosclerosis rose remarkably in comparison with those before moxibustion treatment.

All these indicate that both festering moxibustion and drug-partition moxibustion can regulate the humoral and cellular immune functions of the patient with yang-deficiency. This result will contribute to the studies of the mechanism of moxibustion and the use of moxibustion in treating different diseases.

The Primary discussion of the principle

(i) Neuro-humoral regulation plays an important role in maintaining the stability of internal environments, and is also an important factor affecting immune function. Many experimental studies show that acupuncture therapy can regulate the function of the immune defensive system and appears to do so through the neuro-humoral mechanism.

(ii) When acupuncture points and nerves were blocked with procaine or the local nerves were cut off, the regulatory effects of acupuncture on the function of the reticuloendothelial system disappeared or faded. This indicates that acupuncture exerts its effects on the immune function of the human body only through the efferent peripheral nerves.

(iii) When rabbits were anaesthetised with pentobarbitone or their central nervous systems were inhibited with chlorpromazine, the phagocytic functions of the reticuloendothelial system of the acupuncture group were not different from those of the control group. This suggests that one of the functions of the higher central nervous system is to regulate the immune defensive function of the human body.

(iv) When acupuncture was administered at point Zushanli (St 36) after the two suprarenal glads were removed, no noticeable change of the total white count and phagocytic power were observed.

(v) The effects of acupuncture on allergic diseases might be that acupuncture stimulation changes the ability of the human body to discern antigens, or changes the reactivity of the human body to antigens. All these may have something to do with the release of endogenous ACTH, cortical hormones, antihistamines or antiprostaglandins.

(vi) The effects of acupuncture on the immune defensive system is a very interesting research subject. Research work up to now has primarily shed light on the material basis of the prevention and treatment of diseases with acupuncture. Much more advanced studies should be made to elucidate the internal relationship between acupuncture and the functioning regulation of the immune system.

Dr Chen Han-Ping
Shanghai Research Institute of Acupuncture and Meridian
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Chen Han-Ping.

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