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Treating transient ischemic attack from the evil of Phlegm and blood stasis based on abnormal lipid metabolism

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Abstract: *Transient ischemic attack (TIA) belongs to the category of cerebrovascular disease stroke, is a subtype of ischemic cerebrovascular disease, stroke incidence is very high, and is also an important cause of population death. The occurrence of TIA has a great relationship with vascular abnormalities, the formation of vascular plaque makes the blood vessels hardening and narrowing, and then leads to the occurrence of transient cerebral ischemia.Modern studies have found that the abnormal lipid metabolism is closely related to the occurrence of TIA. Traditional Chinese medicine treats TIA from the "evil gas of phlegm and blood stasis". In combination, the "evil gas of phlegm and blood stasis" is related to the abnormal lipid metabolism, which also confirms that the drugs for reducing phlegm and blood stasis and turbidity can inhibit the metabolic factors of TIA and play a role in preventing and preventing the disease before it is diagnosed.Western medicine's targeted regulation of abnormal lipid metabolism and Chinese medicine's lipid-regulating and pulse-softening therapy may have certain modern research significance.*

Keywords: *Transient ischemic attack, Lipid metabolism, Phlegm turbid.gore*

Transient ischemic attack (TIA) is the neck or vertebral - basilar artery system insufficient blood supply for a short period of time, cause local tissue ischemia causes a sudden, temporary and reversible nerve dysfunction.The duration of the attack is usually less than 30 minutes, and some even show only transient vertigo after self-remission. CT or MRI examination rarely finds the presence of lesions, but TIA has a high recurrence rate, and the risk of stroke progression is also increased.Studies have found that the incidence of stroke within 7 days after TIA is 8%-10.5%, and can be as high as 14.6% at 90 days[1].Domestic scholars have reported that low density lipoprotein cholesterol (LDL-C) is significantly positively correlated with stroke recurrence [2].Homocysteine (HCY) is a risk factor for atherosclerosis [3]. Lipoprotein associated phospholipase A2(Lp-PLA2), as a marker of inflammation, is closely associated with the occurrence of cerebrovascular diseases[4].Reports show that Hcy and Lp-PLA2 are closely related to the prognosis of TIA [5].TIA occurs mostly in the resting state, transient vertigo, headache and black eyes, which can be classified as brain diseases and have a certain relationship with vertigo and stroke precursor.The pathological factors of such diseases lie in wind, fire, phlegm, blood stasis and deficiency, and the key to lipid metabolism lies in the evil of phlegm and blood stasis. Modern research has found thatThe nature of the triglycerides in sputum was related to the elevated levels of serum totalcholesterol (TC), triglyceride (TG) and low-density lipoprotein cholesterol (LDL-C) in plasma, which was a unique biochemical indicator and material basis for "sputum turbidity" [6].This is not only the pathogenesis of TIA, but also the pathway that closely relates TIA and lipid metabolites with phlegm, turbidities and stasis. It also provides diagnosis and treatment ideas for the prevention and treatment of TIA from the perspective of traditional Chinese medicine.

1. Western Medicine's understanding of abnormal TIA lipid metabolism

Abnormal lipid metabolism refers to the abnormal operation pathway and final result of lipid substances in the body. It is a kind of obstacle from synthesis, decomposition, digestion and absorption to transport and application in the body. It is a physiological and pathological process.The main pathological basis of TIA is the formation of atherosclerotic plaques leading to different degrees of

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cerebrovascular stenosis and occlusion, and dyslipidemia is a major risk factor for ischemic stroke and TIA[7].TIA is also associated with low density lipoprotein cholesterol (LDL-C), lipoprotein-associated phospholipase A2 (Lp-PLA2), serum homocysteine (HCY), Uricacid (UA) and other metabolites. Related studies have shown that Lp-PLA2 can induce endothelial cells to express monocyte adhesion molecules, promote the aggregation of monocytes to the intima of blood vessels, and then derivatives into macrophages, thus promoting the formation of atherosclerotic plaques and unstable plaques[8].Lipids include cholesterol (TC), triglycerides (TG), phospholipids (PL), and free fatty acids.The composition of cholesterol (TC) is high-density lipoprotein cholesterol (HDL-C), low density lipoprotein cholesterol (LDL-C), very low density lipoprotein cholesterol.Among all kinds of lipids, cholesterol is considered to be a key factor in atherosclerosis[9]. LDL-C transfers trace substances such as proteins to the vascular wall, increases the thickness of the endosubcutaneous space and the vascular wall, and forms excess oxidized low-density lipoprotein (ox-LDL), which causes endothelial cell dysfunction through pro-inflammatory factors in vascular cells.Monocytes reaggregate into the intima of the artery, and through cell division and transformation, form fatty streaks and eventually become plaques. The levels of monocytes are directly proportional to thrombosis, while HDL-C is just the opposite.Lp-PLA2 can be highly expressed in the necrotic center and surrounding vulnerable macrophages and damaged plaques, hydrolyze and release oxidative free fatty acids, lysophosphatic acid and other inflammatory factors, attract more mononuclear granulocytes to gather at the lesion site, combine with oxidized low-density lipoprotein to form foam cells and promote the formation of atherosclerosis [10].After plaque formation, vascular wall will be damaged and hardened, causing lumen stenosis and reduced blood supply volume, presenting transient vertigo, unilateral limb sensorimotor disorders, blindness in one eye or aphasia, which can be recovered within 24 hours after the onset of the disease. Imaging cannot identify the lesions in time, and plaque formation can only be detected by vascular Doppler ultrasound at ordinary times.

Lp-PLA2, which is a mediator, acts as a related enzyme of proinflammatory substances, is mainly involved in physiological processes such as inflammatory response and vascular endothelial injury, which can increase the risk of thrombosis, aggravate the degree of tissue ischemia [11],HCY is a growth factor that inhibits nitric oxide activity and promotes vascular endothelial cells. When the level of HCY is higher than the normal value, it can cause vascular damage, lead to inflammation and the formation of vascular wall plaque, and promote the formation of atherosclerosis [12], UA is a highly effective antioxidant. Its principle of action is to accelerate the proliferation rate of vascular smooth muscle cells and up-regulate inflammation, which affects the occurrence and development of cardiovascular and cerebrovascular diseases. Studies have found that the level of UA is in direct proportion to the tendency of TIA progression to stroke.In summary, compared with the healthy population, once TIA occurs, the plasma Lp-PLA2, Hcy and UA levels of the patients are increased by different amplitude compared with the normal level, and the plasma Lp-PLA2, Hcy and UA levels are consistent with the serum LDL-C level, but opposite to the serum HDL-C level.

2. Traditional Chinese Medicine's understanding of TIA phlegm and blood stasis

TIA belongs to stroke attack, can be classified as vertigo, small stroke, stroke precursor, etc. Ancient doctors also from the pathogenesis, treatment of many aspects of understanding and analysis, the results are similar to modern research, stroke cannot be separated from wind, fire, phlegm, blood stasis, deficiency, treatment from the phlegm and collagonal circulation, Qi and blood activating, with the combination of phlegm and blood activating drugs.Liu Hui et al. [13]believed that TIA was mainly caused by the obstruction of phlegm turbidity and the disturbance of wind phlegm to clear the body."Suq Disease mechanism Qi should save life collection · On Stroke" recorded: "stroke patients, with the evidence of foresigns, mortal such as thumb and second finger numbness or hands and feet, or muscle peristalsis, there will be a strong wind within three years.TIA does not occur overnight, and its formation process can be long or short, which needs to be analyzed according to the patient's physique,body visible impotence without use.The evil of phlegm turbidity is obstructed in the pulse, blood is not good, and the function of the viscera is dysfunctional, which is easy to produce phlegm, turidity and stasis. There is a saying in ancient books that many diseases are caused by phlegm. Phlegm turbidity and blood stasis always run through the whole pathological process, both of which are pathological products and pathogenic factors.

Phlegm causes a wide range of diseases, and blood stasis is caused by phlegm. Professor Deng Tietao made a statement:"Phlegm is the primary stage of blood stasis, and blood stasis is the further development of phlegm." Phlegm will produce blood stasis for a long time, and blood stasis will also affect the metabolism of water, causing the water to stop inside and turn into phlegm, and phlegm and blood stasis will interlock with each other and block the vein, thus leading to ischemic stroke [14]. Zhu Min[15], Ma

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Zhiheng[16] and other doctors also believe that stroke is closely related to the evil of phlegm and blood stasis.Phlegm evil spirits can be hidden in the viscera, forming tangible phlegm, or because of excessive eating fat and sweet taste, spleen deficiency and weak health transport produce invisible phlegm turidity, phlegm turidity for a long time and blood stasis, phlegm turidity and blood stasis are used for each other, dependent on each other, and then block the pulse, can not supply the brain, become the cause of TIA, with time untreated, phlegm stasis evil spirits poison, long illness wind, can lead to the occurrence of stroke,Its treatment difficulty and effect will be inferior to the initial formation stage of phlegm turbidiousness.There are many syndrome differentiation in the occurrence process of TIA, only one of which is phlegm, blood stasis and turbidity. Throughout the whole process, we should distinguish between deficiency and substance, correctly grasp the method of removing phlegm and blood stasis, and reduce the risk of stroke.

3. The correlation between TIA and lipid metabolism and phlegm stasis

Lipids, or lipid substances, exist in the transport of tissues of the body, provide the body with energy for activity, and ensure the normal work of the body. They have the same function as Qi, blood and body fluid in traditional Chinese medicine.Human intake of lipids within the normal range, the normal metabolism of lipids can prevent many diseases while ensuring the operation of the body, but the relative intake of too much or too little, will increase the possibility of disease occurrence.Excessive intake of lipids will cause problems in gastrointestinal absorption and digestion, and increase the blood content, leading to hyperlipidemia, which is manifested as abnormal TG, TC and LDL-C. Lipid deposition can also form plaque, which can lead to atherosclerosis and further stiffen and reduce the elasticity of blood vessels, and also become the potential risk of TIA.Some studies have proved that lipid metabolism disorder is an important biochemical substance basis for "phlegm turbidity" in traditional Chinese medicine, and some scholars say that phlegm turbidity and blood stasis are the basic causes of metabolic syndrome (MS). Therefore, abnormal lipid metabolism is closely related to "phlegm turbidity and blood stasis" in traditional Chinese medicine.Zhang Daming [17]and Yang Li et al.[18]] believed that the pathogenesis of hyperlipidemia was phlegm stagnation of blood vessels, and the grease in blood came from the thick and turbified part of diet. Normal operation could nourish the viscera and provide energy for the balance of Yin and Yang, while the excess would turn into evil spirits.

Studies have shown [19] that lipid profile is mutually related to the formation of arterial plaques and plays a key role in the pathophysiology of carotid plaques [20], and lipids are the pathogens of phlegm and blood stasis, and phlegm turbidity can also be understood as a clinicopathological factor of hyperlipidemia and high lipoprotein. Therefore, the treatment of TIA based on phlegm and blood stasis has literature support.If the body ingest too much fat and sweet taste, and cannot cooperate with proper exercise for healthy digestion, it will lead to bad qi, accumulation of phlegm, poor blood flow, dirty and turbidite accumulation in blood vessels, lipid accumulation, thick and coagulated blood, change into stasis, phlegm turbidite and blood stasis in the pulse, body fluid can not run.Chinese medicine pays attention to the occurrence of diseases with "no general rules of pain, noRong is painful "said, although TIA has no obvious pain, but the head of the blood channel block, can not be immersed in the brain, can see dizziness and dark eyes, the distal extremities of the blood obstruction, the extremities feel numb.

4. Treatment of TIA from the perspective of traditional Chinese and Western Medicine

From the perspective of western medicine, it is currently believed that the pathogenesis of TIA is as follows: based on atherosclerosis, the formation of microembolism, hemodynamic effects, changes in blood viscosity and coagulation, which eventually lead to focal ischemia in brain, spinal cord, retina and other areas, followed by transient neurological deficits [21].When the neck artery or vertebrobasilar artery vessels narrow, it can affect the hemodynamics, decompensation of cerebral circulation reserve, low perfusion flow changes the function of neurons, and further irreversible damage of neurons is referred to as stroke.There are many reasons for artery stenosis and atherosclerosis, and age, gender, race, genetics, tobacco and alcohol history, hyperglycemia, hypertension, obesity, dyslipidemia metabolism, high Hcy and other risk factors can be listed. Non-interventionable factors such as age, gender, race and heredity can be excluded, and other factors should be emphasized for prevention.Excluding risk factors, the common carotid TIA can be manifested as hemiplegia, hemiplegia and facial paralysis, and can also be the transient black outside or blind. The most common symptoms of vertebrobasilar TIA are vertigo, nausea and vomiting, tinnitus, and swallowing and dyslexia may also occur. Judging from its symptoms, it can be similar to acute stroke.However, due to its short onset time and no obvious imaging features for

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identification, DWI NMR weighted imaging can be used to determine whether there is ischemia focus when it is not conducive to its diagnosis. Due to its short onset time, the patient's symptoms may have been relieved when he visited the doctor, and the treatment purpose of TIA is to prevent the occurrence of stroke.Modern medicine uses anti-platelet aggregation drugs such as aspirin, clopidogrel and lipid-lowering statins to control its occurrence frequency. If the blood vessels are severely narrow or even exceed 50%, certain surgical treatment can be performed, such as carotid endarterectomy (CEA) or carotid artery stenting (CAS). Meanwhile, attention should be paid to preventing the influence of other risk factors.

From the perspective of traditional Chinese medicine, TIA should be treated from many aspects and viscera.The Chinese medicine emphasizes the holistic view and the unity of heaven and man, and treatment based on syndrome differentiation is also needed in disease differentiation. Medical practitioners have different understandings of TIA. According to the patients' different tongue and pulse signs, TIA can be divided into different syndrome types, such as qi stagnation, phlegm turbidity, blood stasis, Yin deficiency, Qi deficiency and so on.It can benefit Qi, promote blood circulation and remove blood stasis, purify phlegm decoction, Taohong Siwu decoction and buyang HuanWu decoction , Tianma Gouteng decoction for calming liver and eliminating wind and collaterals,Banxia Baizhu TIanma decoction for strengthening spleen and dampness and removing phlegm, tonifying kidney Jing Heche Dazao Wan, etc.From the perspective of phlegm and blood stasis, the treatment of phlegm and blood stasis also has more experience.Synopsis of the Golden Chamber is the first to take the lead. Zhong Jing recorded "Hou's Black Powder cures wind" in the chapter on stroke, which started the first treatment of stroke with phlegm and blood stasis. Later, Zhu Danxi and Wang Qingren contributed a lot of experience in the theory of phlegm and blood stasis.The relationship between paste fat and phlegm and blood stasis lies in that the source of phlegm is extensive, the blood stasis is the change of phlegm, the increase of ointment fat in viscera and veins, obstruction of blood, phlegm is mostly produced by body fluid, is the pathological product of water and liquid metabolism disorders, paste fat is blood fat, and blood fat is also produced by body fluid, for its thick and thick part, paste fat blood turbidities with each other, so the treatment should be to reduce phlegm, promote blood circulation and remove blood stasis.Research findings [22][23]: purify phlegm decoction can regulate lipid metabolism, reduce the levels of TG, TC and LDL-C in rat models, and improve the antioxidant stress efficacy. Taohong Siwu decoction can lower blood lipids, dilate blood vessels, anti-inflammatory, antioxidant damage and neuroprotective effects.Peach kernel also has the functions of expanding peripheral blood tubes, increasing blood flow, inhibiting platelet aggregation, anti-coagulation, anti-thrombosis and promoting fibrinolysis. Studies have found that safflower yellow pigment, the active component of safflower [24], can effectively reduce the plasma viscosity, whole blood viscosity and red blood cell aggregation index of blood stasis model rats, as well as anti-coagulation and anti-thrombosis. Therefore, the treatment should be based on expectoration, blood circulation and blood stasis.Regulate the fat in the brain pulse sputum turidity, blood stasis, make the brain pulse unobstructed, restore the movement of Qi and blood, and nourish the brain and brain.

5. Conclusion

It can be seen from the whole paper that sputum turidity and stasis are related to lipid metabolism, both of which are pathological factors leading to the occurrence of TIA. Referring to other literature, this can also lead to the occurrence of other cardiovascular and cerebrovascular diseases. TIA may only be a pathfinder of disease types, but it can't be ignored, so the prevention and treatment of TIA is of great significance to prevent the occurrence of other cerebrovascular diseases.In daily life, exercise, control the intake of lipid substances, and monitor the levels of TC, TG, LDL-C and Hcy, so as to prevent the disease before it occurs. When TIA occurs, active treatment should also be carried out by combining anticoagulant aspirin, clopidogrel, lipid-regulating and spot-stabilizing statins with traditional Chinese medicine prescriptions for eliminating phlegm and blood stasis, so as to improve blood lipids and vascular plaques.The combination of traditional Chinese and Western medicine TIA has a good prospect and will become the main mode in TIA treatment.

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