

Analysis of the relationship between subclinical hypothyroidism and anxiety and depression based on the theory of “Yi(liver) and Gui(kidney) from same source”

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Abstract: For a long time, the influence of subclinical thyroid dysfunction on anxiety and depression has been ignored, and the focus of research is on the influence of obvious thyroid dysfunction on mood. In recent years, the research on the effect of subclinical hypothyroidism on anxiety and depression has gradually increased, and the effect of subclinical hypothyroidism on mood has been re-emphasized. At present, the main measures for clinical diagnosis and treatment of subclinical hypothyroidism in China are clinical observation rather than drug intervention. In fact, patients do have negative emotional changes, which seriously affect people's sleep, study and work. Therefore, in this context, the advantages of traditional Chinese medicine are highlighted again. This paper aims to explore the essence of the relationship between subclinical hypothyroidism (SCH) and anxiety and depression based on the theory of "Yigui homology", so as to provide clinical diagnosis and treatment ideas.

1. Introduction

Subclinical hypothyroidism (SCH) is a common dysfunction of the hypothalamic-pituitary-thyroid axis [1], which is characterized by an increase in thyroid-stimulating hormone (TSH) levels and a normal or insignificant decrease in free circulating thyroid hormone (FT4). With regard to the relationship between thyroid dysfunction and emotions, the association between significant thyroid dysfunction and severe negative emotions has been confirmed [2]. As for the impact of subclinical thyroid dysfunction on emotions, some scholars have insisted in the past that SCH does not affect emotions. They suggest that biochemical thyroid dysfunction is not associated with anxiety or depressed mood [3]. In recent years, the research on SCH has gradually increased, and some scholars have reported that subthyroid dysfunction or thyroid insufficiency significantly affects human mood, especially subclinical hypothyroidism, which is associated with depressive symptoms [4-5]. A study in SiChuan Province of China [6] showed that subclinical hypothyroidism affected the occurrence of anxiety. Therefore, negative emotions such as anxiety and depression caused by SCH can not be ignored.

2. Present research basis

2.1. SCH and anxiety and depression

The coordination of endocrine and nervous systems plays an important role in maintaining the homeostasis of the internal environment, and the mediation between them is the hypothalamus pituitary thyroid hormone system. The central nervous system affects the hypothalamus pituitary thyroid axis, and various brain functions, including cognitive and emotional functions, depend on the hormones of this axis [7-8].

Some foreign scholars have found through research [9] that there is no relationship between abnormal thyroid hormone levels and increased risk of depression, but there may be a relationship between thyroid hormone levels within the normal reference range and depression. The conclusion is that patients with subclinical hypothyroidism may lead to mild emotional defects. In India, Gaurav Vishnoi [10] et al. found in a pilot study that high levels of thyroid-stimulating hormone (TSH) in SCH patients were associated with Hamilton Depression Rating Scale (HAM-D) scores, suggesting that the severity of depression was associated with worsening thyroid status. The achievement of euthyroid status was associated with improvement in mood as assessed by administration of levothyroxine and the HAM-D scale. It was concluded that serum TSH levels in SCH patients were positively correlated with the HAM-D score. Lea Wildisen [11] et al. found that the causes of SCH affecting mood were related to age, TSH level and sex hormone level through the supplementary study of randomized clinical trials. Syed Abbas Raza [12] et al. compared young women with SCH and control groups, and found that SCH women were more likely to be stimulated by unpleasant emotions, leading to introversion and anxiety. Studies such as Loh HH [13] have found that adults with SCH, especially the elderly, have a 2.5 times higher risk of depression. The Benedetta Demartin [14] study also highlighted a strong association between subclinical hypothyroidism and depressive symptoms. The results of some studies beyond the common perception show that people with SCH are more likely to develop depression than those with overt hypothyroidism or euthyroidism [15-16]. Feng Min [17] et al. found that SCH may cause anxiety and depression in pregnant women, and oral administration of levothyroxine sodium tablets can improve the corresponding symptoms. On the other hand, SCH also had an effect on the emotional changes of the offspring. Liu Zijian [18] et al. have shown that maternal pure SCH is associated with emotional problems in preschool children before 20 weeks of pregnancy. Taken together, these results support the conclusion that mood is altered when subclinical hypothyroidism is present.

2.2. Anxiety, depression and comorbidity

With regard to anxiety and depression, the modern understanding is that anxiety is an unpleasant complex emotional state, including anxiety, anxiety and annoyance, caused by the imminent threat (danger) of things (events). Depression is characterized by significant and persistent depression, as well as the decline of activity, thinking and cognitive retardation [19]. However, in clinical work, it is easier to come into contact with comorbidity of anxiety and depression (anxiety and depression state). Studies have shown that the comorbidity of depression and anxiety disorders is 19.2%~80%, of which 60%~90% of patients are depression with anxiety, 50% are anxiety with depression [20], while the proportion of simple disease forms is relatively small [21]. The comorbidity of anxiety and depression was more significant than that of simple anxiety or depression [22].

3. Theory of “Yi(liver) and Gui(kidney) from Same Source”

3.1. Analysis of the Essence of Theory of “Yi(liver) and Gui(kidney) from Same Source”

3.1.1. Ancient Discourse

With regard to “Yi(liver) and Gui(kidney) from same source” or “the same origin of liver and kidney”, the essence of “Yi and Gui” is “liver and kidney”. The ancients classified Jia Mu and Yi Mu as gallbladder and liver respectively by combining the five internal organs and the six hollow (Fu) organs with the heavenly stems. Ren water and Gui water are attributed to bladder and kidney respectively, so the following discussion of “Yi Gui” will be based on “liver and kidney”. There are many discussions by physicians of different generations. Miraculous Pivot: “The straight portion of the Foot-Shaoyin Meridian originates from the Kidney, passes through the Liver, and enters the Diaphragm.”; Plain Questions: “Liver qi failure, inability to move tendons, depletion of qi, lack of essence, kidney storage failure, and extreme physical condition”; Shang Han Za Bing Lun: “The Kidney and Liver are the foundation of the human body and if the Kidney is flourishing while the Liver does not contract, the root will be consumed and the source will be cut off, thus leading to the condition of "duan xie"”. Zhong Zang Jing: “When yin goes down, the kidney and liver are frozen Apoplexy in both the liver and kidney results in paralysis of the hands and feet.” Bei Ji Qian Jin Fang contains the following passage, "During winter, when the Kidney water is in abundance, the pulse is deep, slippery, and smooth, which indicates that the Liver is riding on the Kidney and the child is riding on the mother. Zhang Shi Yi Tong : " Qi is not consumed, it returns to the kidney and becomes essence, and essence is not discharged, it returns to the liver and becomes clear blood ". To sum up, the relationship between "kidney" and "liver" can be understood from the meridian connection, physiological connection and pathological connection.

3.1.2. Modern Discourse

Modern studies have found that the physiological function of "liver" in traditional Chinese medicine is related to neuroendocrine-immune system, autonomic nerve function, coagulation mechanism and hormones [23]. Yan Can [24] et al. have shown that the hypothalamic-pituitary-adrenal axis is physiologically related to the "liver" of traditional Chinese medicine, and the "liver" may affect the process of chronic psychological stress response by affecting neurotransmitters, neuropeptides and hormones. Through these studies, it can be considered that the function of "liver" governing emotions and smoothing the flow of qi may be related to hypothalamus-pituitary-target axis or target organs (target cells), and "liver storage" in traditional Chinese medicine regulates emotions through neuroendocrine system. As for "kidney", some studies have shown that the pathogenesis of "fear of kidney injury" [25] is caused by the disorder of neuro-endocrine-target organs or target cells. Qi Xiaohua [26] et al. found that "kidney" in traditional Chinese medicine is closely related to pituitary-thyroid axis, pituitary-gonad and pituitary-adrenal cortex. Shen Ziyin [27-28] et al. confirmed that the important regulatory point of kidney-yang deficiency syndrome was located in the hypothalamus at the molecular gene level, and also confirmed that the pathological basis of kidney-yang deficiency syndrome included neuroendocrine-immune system. "Liver and kidney" play physiological roles through neuroendocrine systems such as hypothalamus-pituitary-targeting axis or target organs (target cells), so the common physiological and pathological functions of liver and kidney in "Yigui homology" may play roles through neuroendocrine systems (hypothalamus-pituitary-targeting axis).

4. Discuss the relationship between SCH and anxiety and depression with "Yi(liver) and Gui(kidney) from Same Source"

4.1. "Yi (liver) and Gui (kidney) from Same Source" and SCH

Combined with modern medicine, subclinical hypothyroidism (SCH) belongs to the category of "consumptive disease", "palpitation", "edema" and "gall fatigue" in traditional Chinese medicine [29]. "Consumptive disease" refers to deficiency of qi and blood, and fatigue refers to the injury of the five internal organs. The five internal organs store essence, and the injury of the five internal organs impairs the essence. Therefore, "deficiency of essence and blood" or "deficiency of liver and kidney" is the essence of "consumptive disease". The scope of "consumptive disease" discussed by ancient physicians is relatively wide, and this paper focuses on the "consumptive disease" of SCH. The close relationship between "consumptive disease" and "Yi Gui" of SCH is reflected as follows: (1) In Synopsis of Prescriptions of the Golden Chamber, Zhongjing discussed blood arthralgia and consumptive disease together, that is, long-term overwork hurts the essence and blood, while the kidney stores essence and the liver stores blood, and long-term overwork will involve the liver and kidney; (2) Shou Shi Bao yuan says: "a person with consumptive disease has deficiency of kidney water and internal steaming of heart fire, and his vexation will lead to restlessness", which shows that the kidney is closely related to consumptive disease, the kidney stores essence and will, and people are based on essence and blood, so when essence and blood are damaged, internal heat will lead to restlessness; (3) Li Xu yuan Jian says: "There are six causes of deficiency, including congenital causes, acquired causes, causes of pox and after illness, exogenous causes, causes of circumstances, and causes of medicine"; Or lust hurts the kidneys and the kidneys are not strong Or depressed anger hurts the liver and the liver is weak and can not be reconciled, both congenital and acquired can lead to consumptive disease by affecting the liver and kidney; (4) The consumptive disease originates from the lung, heart and spleen, but not from the liver and kidney. The lung is in the upper part and is hidden, exogenous pathogens and internal injury first invade the lung, lung yin is injured by overstrain, metal does not produce water, and the liver and kidney are involved, resulting in consumptive disease, cough due to overstrain, hematemesis and bone steaming; Li Dong Yuan initiated to discuss consumptive disease with spleen and stomach. The spleen is in charge of ascending and the stomach is in charge of descending. The liver and kidney ascend to the left to help the spleen ascend, and the heart and lung descend to the right to help the stomach descend. Therefore, the spleen and stomach can be transported and transformed, the five viscera are harmonized, and the spirit, qi, essence and blood are mutually generated in order, so there is no consumptive disease. The heat generated by consumptive disease should be removed by sweet and warm. Dan Xi discusses that consumptive disease is responsible for the kidney, the heart governs the blood, the liver stores the blood, the kidney governs the essence, and the essence is the root of blood, and the exhaustion of essence and dryness of blood lead to consumptive disease.

4.2. "Yi(liver) and Gui(kidney) from Same Source" liver and kidney and anxiety and depression

4.2.1. Kidney and Emotion

Internal Classic of Huang Di says: "The Heart governs the spirit... The essence produced during birth is called Jing, and the mutual struggle of two Jing is called She". Yi Fang Ji Jie says: "The essence and will of a person are both stored in the Kidneys and if the Kidney essence is insufficient, the willpower will weaken and cannot ascend to the Heart, causing confusion and forgetfulness". Nei Jing Bo Yi says: "The essence and will of a person are both stored in the Kidneys". In traditional Chinese medicine, "kidney" is closely related to emotions. If the kidney essence is insufficient, the

kidney will not store emotions, and there will be emotional disorders. This is also in line with the current dialectical materialist philosophy, that is, any spiritual or thinking activity needs material basis, the material basis of human spiritual activities is "heart blood, kidney essence", heart blood and kidney essence can be transformed into each other, that is, "heart and kidney intersection". Therefore, the function of "kidney" affects "will", and the basic theory of traditional Chinese medicine holds that "will" includes anger, joy, anxiety, sadness and fear, so "kidney stores will" is closely related to anxiety and depression.

4.2.2. Effect of “Yin and Yang” of the Kidney on Anxiety and Depression

It is said in *Jing Yue Quan Shu* that “The Ming Men (Gate of Life) is the root of the original Qi, the residence of Water and Fire, and the Yin Qi of the Five Zang Organs cannot nourish without it, while the Yang of the Five Zang Organs cannot be generated without it”. It is also said in *Tao Te Ching* that “Tao gives birth to one, one to two, two to three, and three to all things”. Anxiety and depression can be seen from the contradiction of “Yin and Yang” of the human body, and the kidney governs the Yin and Yang of the whole body. According to the clinical manifestations, anxiety belongs to “Yang” and depression belongs to “Yin”. At the same time, according to the dialectical thinking of Yin and Yang, Yin and Yang often appear at the same time. In clinical practice, the most common symptoms of anxiety and depression are not “black or white”, that is, the two often appear at the same time many times a day. It does not occur alone (this view can also be proved by the previous study of comorbidity of anxiety and depression). The clinical manifestations of anxiety and depression can be considered as the morbid changes of the imbalance of yin and Yang in the human body, and yin and Yang begin with primordial qi. Taoism argues that the root of primordial qi lies in the Dantian, and *Qin Yue Ren* say that primordial qi lies in the gate of life in *Nan Jing*. Although the location of primordial qi is different, it is closely related to the kidney. Because primordial qi is born from the innate, and the kidney is the “innate foundation”, so it is born from the kidney. It also commands the balance of Yin and Yang in the human body. As it is said in the *Canon of Internal Medicine*, “Yin quietness and Yang impetuosity”, the excess of Yang impetuosity is manifested as anxiety, and the deficiency of Yin quietness is manifested as depression. Regardless of deficiency or excess, excess of yin is manifested as “quietness”, while excess of Yang is manifested as “quietness”. The comorbidity of anxiety and depression is “the same disease of yin and Yang”, that is, “deficiency of both yin and Yang, Yang floating on the top and yin deficiency on the bottom”. Therefore, the occurrence of anxiety and depression can be understood by the relationship between “Yin and Yang”.

The *Canon of Internal Medicine* says: “Deficiency of Yang leads to external cold, deficiency of yin leads to internal heat, excess of Yang leads to external heat, and excess of yin leads to internal cold”. The changes of “yin and Yang” of the kidney can also be further understood in the pathophysiology of other diseases in traditional Chinese medicine. First, “menopausal syndrome” is characterized by “sudden hot sweating, irritability, dysphoria, but the lower limbs are afraid of cold and wind”. Most clinical physicians discuss that the pathogenesis is that yin deficiency cannot restrain Yang, but Yang floats on the top, but the essence is deficiency of both yin and Yang, but yin deficiency is more serious than Yang deficiency, the treatment is mainly to nourish yin and suppress Yang, rather than bitter and cold drugs to “clear”; Second, “the man loses the sperm”, *Zhang Zhong Jing* by the cassia twig dragon bone oyster soup host, “*Han Shi Yi Tong*” then cloud: The prime of life color is overworked, only reduces the fever, does not need to fill ... For the treatment of color fatigue, the ancient prescription of *Dixian San* decoction is first used to “ebb the tide and fever”. Although it is a disease of men and women, it is due to the imbalance of Yin and Yang, so the treatment method is essentially the same, that is, “astringing Yang and reducing fever”. The essence of climacteric syndrome and sexual overstrain disease is “kidney deficiency”, which can be manifested as hyperactivity, fatigue or vexation. The “kidney deficiency” of “consumptive disease”

of SCH causes changes in Yin and Yang, and the essence of anxiety and depression emotional changes (hyperactivity or fatigue) is the same.

4.2.3. “Liver” and anxiety and depression

There is a saying in the Inner Canon of Huangdi: “The Liver is the official of the General, from which plans and strategies are developed... In terms of emotions, the Liver is associated with anger... When the Liver Qi is deficient, there is fear; when it is excessive, there is anger... Those with Liver disease are easily frightened, as if someone is going to capture them” Shou Shi Bao yuan discusses: “When the Liver Qi is deficient, one cannot sigh, is prone to anger, and easily frightened, as if someone is going to capture them. This is a manifestation of Liver Qi deficiency.” As for the liver in charge of smoothing the flow of qi. Plain Questions · Wu Chang Zheng Da Lun states that “the earth smoothes the flow of qi”, and Ge Zhi Yu Lun states that “the liver is in charge of smoothing the flow of Qi”. Therefore, the theoretical system of traditional Chinese medicine holds that the liver is in charge of soothing the circulation of qi and regulating emotions. With regard to “liver” and emotions, Li Yongle [30] also summarized the relationship between “liver” and emotions in Huangdi Nei Jing, and found that “liver” is closely related to emotions such as “fear, worry, anger and surprise”. Therefore, “the liver is in charge of smoothing the flow of qi” is the core of “regulating emotions”. Inner Canon of Huangdi holds that “the liver is the root of exhaustion”, and “exhaustion” here refers to “fatigue” [31]. It is said in Lei Jing that “people's exercise is due to the strength of their muscles and tendons. If they exercise too hard, their muscles and tendons will be exhausted”. The ancients discussed physical labor, but in today's society, people not only have physical labor, but also mental labor and physical labor. The social relations are complex and the mental burden is too heavy, which seriously affects the physiological function of “catharsis”. It is often called “psychological fatigue”, which results in fatigue, irritability, poor spirit and work. In the long run, there are more depression and anxiety tendencies such as suicide.

4.3. Discuss the interaction between hypothyroidism and anxiety and depression with "Yi(liver) and Gui(kidney) from Same Source "

Chao Yuanfang said: “Five kinds of fatigue, one is the fatigue of the will, two is the fatigue of thinking, three is the labor of the heart, four is the labor of anxiety, and five is thin fatigue.” Chao also said: “Gall is caused by the stagnation of anxiety.” Therefore, the incidence of SCH's “consumptive disease” is closely related to the negative emotional basis. The basis of SCH's “consumptive disease” caused by negative emotions such as anxiety and depression is also the dysfunction of “Yi and Gui homology”. Liver and kidney deficiency. “Liver” governs emotions, “kidney” stores emotions, and “heart” stores spirit. When people have anxiety and depression, the “heart” is harmful, but ultimately it affects the “liver and kidney” and leads to the “consumptive disease” of SCH. Under the predicament, negative emotions such as anxiety and depression first consume heart yin and heart blood, and heart yin and heart blood depend on “liver and kidney” (the theory of mutual promotion of five elements), which leads to deficiency of liver and kidney. Repeated mental stress stimulation causes the abnormal function of “Yi Gui” (the abnormal function of “the liver's dispersion and the kidney's storage”), the liver does not disperse, the Qi movement is not smooth, the airway is blocked, and the body is depressed, which is manifested locally as excess Qi (Dan xi said: “excess Qi is fire”), and the evil fire damages the liver Yin and causes people to have anxious negative emotions. In addition, the monarch's fire is generated in the kidney and stored in the heart (water and fire are combined), and the ministerial fire is generated in Jia Mu of the gallbladder and is dense in the kidney, relying on the sealing function of the kidney. If the kidney fails to seal, the gallbladder qi will not descend and the ministerial fire will ascend, disturbing the heart, further

depleting the heart yin and heart blood, and the deficiency of heart yin and heart blood will continue to aggravate the “deficiency of liver and kidney”. Si Sheng Xin Yuan mentions: “Liver wood is the warm rise of kidney water”. Abnormal emotional state leads to liver deficiency. Over-emotional depression, which affects freeing the liver.kidney yang deficiency, which cannot raise the temperature of the kidney. If the liver fails to rise, it becomes depressed and shows symptoms such as depression. Liver depression without release causes anxiety and depression to persist, and liver depression ravages the spleen and stomach, causing the spleen to fail to move and transform, damaging the acquired foundation.Ultimately it leads to the deficiency of all five organs and exacerbates the "deficiency and exhaustion" of SCH.

It is said in the Canon of Internal Medicine: “Liver deficiency, kidney deficiency, and spleen deficiency all make people feel heavy and vexed”. In Treatise on the Causes and Symptoms of Various Diseases, it is said: Liver overstrain Spirit does not keep, fear can not lie alone. The Origin and Development of Miscellaneous Diseases by Rhinoceros Candle says: “When the essence is injured, the kidney water is empty” Gold and water are weak, unable to overcome their liver-wood. Instead of making a fire. Miraculous Pivot says: “Those who come and go with God are called the soul If the soul is injured, it will be crazy to forget the essence, and if it is not refined, it will be an improper person. The liver stores overstrain, and the liver does not store the soul due to insufficient liver blood. People's abnormal knowledge and perception show negative emotions of apathy, depression and unhappiness, which is called an improper person. It is said in Miraculous Pivot: Therefore, the five Zang organs are in charge of storing essence. They cannot be injured. If they are injured, they will be lost and suffer from yin deficiency.Long-term deficiency leads to overstrain, which often involves the five Zang organs, and is mainly due to hyperactivity of fire due to yin deficiency. The kidney water is empty, the kidney water can not appear, resulting in heart and kidney disharmony, the kidney water can not calm the heart fire, and hurt the heart blood and heart yin, heart fire alone; The heart fire is exuberant and the lung gold, the gold does not produce water, the kidney water is insufficient, the gold water is weak, but the gold cannot overcome the liver wood, then the wood is prosperous; The wood is strong and overcomes the spleen and earth, and finally the five internal organs are all sick, so the ancients said: “All diseases are born in the kidney”. On the one hand, Wuzang overstrain can lead to emotional abnormalities. Deficiency of kidney essence can cause pathogenic fire and lead to anxiety, and also cause “liver fatigue” due to “homology of Yi and Gui”, which affects the liver's function of governing emotions and smoothing the flow of qi, resulting in depression, while deficiency of liver and kidney can also cause palpitation, vexation and anxiety. The kidney is the root of Yang, and the spleen is the acquired root governing transportation and transformation. If the kidney-yang is insufficient, the spleen-yang qi will not ascend and be unable to transport and transform, resulting in depression due to deficiency of middle-jiao qi. Liver qi ascends to the left with spleen qi, and lung qi descends to the right with stomach qi. Liver qi does not ascend, and if it does not ascend, it will not descend. If lung qi does not descend, it will stagnate in the lung, and the upper energizer will be blocked, so qi disappears and causes sadness. Therefore, the “consumptive disease” of SCH can also aggravate negative emotions. On the other hand, in the state of "virtual labor" of SCH, the human body shows various deficiencies (mainly deficiency), and the "resistance" to negative emotions decreases (the liver is the root of extreme depression). It shows psychological "vulnerability and sensitivity". The human body can't continue to bear the continuous "Psychological stress", and the body will produce greater negative emotions when the next difficulty or dilemma comes.

5. Conclusions

Hypothyroidism can affect the human body to produce anxiety and depression, the essence of

which is “consumptive disease”. When combined with SCH, that is, in the state of “consumptive disease”, people's tolerance to the pressure of life and work will also be weakened, resulting in persistent negative emotions of anxiety and depression. Combined with the theory of “Yi(liver) and Gui(kidney) from Same Sourc”, the etiology and pathogenesis of anxiety and depression is “deficiency of liver and kidney”, so the underlying disease of anxiety and depression caused by SCH should also belong to the category of “consumptive disease”, and other therapies should be added on the basis of tonifying deficiency methods such as tonifying liver and kidney. Modern studies suggest that structures related to anxiety and depression and other emotions are mainly in the limbic system of the cerebral cortex, hypothalamus and reticular formation of the brain stem [32], and the physiological basis of “Yi-Gui homology” is also related to the neuroendocrine system (hypothalamus-pituitary-targeting axis), so anxiety and depression under the influence of “consumptive disease” of SCH are not a single psychological disease. It is a complex disorder of neuroendocrine system, which can be understood as anxiety and depression caused by “pressure” in life and work, which repeatedly stimulates the limbic system (nervous system) and then affects the comprehensive changes of hypothalamus-pituitary-targeting axis (endocrine system).

6. Outlook

As for the negative emotions of anxiety and depression, because they do not have obvious physiological abnormalities or organic lesions, patients are often excluded by others and regarded as “painless groaning”, which drives most clinicians or family members to pay less attention to the negative emotions, which are also attributed to simple psychological diseases by most physicians. The concept of “heart disease needs heart medicine” is deeply rooted in the hearts of the public, so the treatment program is relatively single, the more common program is to guide patients to adjust their mentality or psychotherapy to comfort patients, but not all of them are effective, what's more, there is no effect. This requires clinicians to re-examine the causes of the negative emotions, perhaps part of the negative emotions of anxiety and depression is not a simple mental illness, but a common external clinical symptoms such as fever, anemia and fatigue, which are similar to most diseases, and the underlying reasons are complex internal diseases such as SCH. Not a simple mental illness. Researchers should further discover and confirm the physiological and pathological mechanisms of negative emotional changes caused by complex medical and surgical diseases through a large number of basic or clinical experiments (trials).

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