Pisco Med Publishing

Pathological Research Progress of Obsessive-compulsive Disorder in Children and Adolescents

Fengting Zhao
Fuyang Special Education Vocational College, Hubei Province, zhaoft@piscomed.com

Abstract: Obsessive-compulsive disorder is a typical mental disorder, which has a lasting impact on children and adolescents' life and learning. Multidisciplinary studies have explored the pathological mechanism of obsessive-compulsive disorder from different angles. Imaging studies have found that the structural and functional connections of multiple brain regions in children and adolescents with obsessive-compulsive disorder are abnormal, and cerebral blood flow and metabolic level of brain tissue are abnormal. Biological studies show that there are abnormalities in neurotransmitter metabolism, genes and cytokines in children and adolescents with obsessive-compulsive disorder. Cognitive behavior research holds that children and adolescents with obsessive-compulsive disorder have different cognitive functions such as memory and attention from normal children. Although the above research results are controversial, they have important reference value for in-depth study of the pathology of obsessive-compulsive disorder and intervention of children and adolescents with obsessive-compulsive disorder.

Keywords: Obsessive Compulsive; Disorder Children and Adolescents Imaging; Research Biology; Research Cognitive; Behavior Research

Obsessive compulsive disorder (OCD) is a common chronic mental disorder, which is manifested by repeated painful compulsive thinking or behavior [1]. The disease mostly originates from the late adolescence or early adulthood, usually after the age of 25, accompanied by depression, with an incidence rate of 1% ~ 3% [2] " In recent years, there has been an increasing trend in clinical research on obsessive-compulsive disorder among children and adolescents, of which clean obsessive-compulsive disorder is the most common type, [3-4]. They often have compulsive behaviors such as repeated cleaning and repeated examination, which have a serious impact on their life, learning and development and require high attention. This article reviews relevant pathological etiological studies in imaging, biology, cognitive behavior and other fields, hoping to deepen people's understanding of the disease and improve the level of treatment and education training for children and adolescents with the disease.

1. Imaging Research

Obsessive-compulsive disorder is a disease with abnormal central nervous system activity. Using imaging technology to study obsessive-compulsive disorder is currently one of the most important means, such as diffusion tensor imaging, functional magnetic resonance, single photon emission computed tomography, positron emission tomography and magnetic resonance spectroscopy.

1.1 Diffusion Tensor Imaging Study

It is a new noninvasive imaging technology that can detect the integrity of white matter myelin sheath, directional consistency and changes in nerve fiber bundle density. Li Z et al. found that the fractional anisotropy (FA) of left accumbens in drug-resistant group was significantly lower than that in non-drug-resistant group, [5] ,suggesting that left accumbens may be an important target for treatment of obsessive-compulsive disorder, [5] Rosso et al. found that the lateral diffusion coefficient (RD) of the right prefrontal cortex and the right corpus callosum in children and adolescents with obsessive-compulsive disorder was significantly increased, and the anisotropy of the right thalamus score in younger

patients decreased, but the above two indexes were not correlated with the severity of the disease [6]. gan et al. found that the anisotropy of corpus callosum, left anterior radiation crown, left upper radiation crown and left upper longitudinal beam fraction in obsessive-compulsive disorder decreased, and the transverse diffusion coefficient of knee and body of corpus callosum increased [7].

Although the research on diffusion tensor imaging in obsessive-compulsive disorder is still inconsistent, the existing research still finds that structural changes have taken place in their cranial nerve fibers, which is one of the important mechanisms for the occurrence of the disease. This means that diffusion tensor imaging examination may have certain value in the diagnosis and treatment effect monitoring of obsessive-compulsive disorder.

1.2 Functional magnetic resonance study

Imaging, fMRI) Most studies show that OCD patients have abnormal brain activity under task load. QIU and other studies show that there are abnormalities in cortex-striatum-thalamus-cortex loop, thalamus, cerebellum, parietal cortex and temporal cortex of obsessive-compulsive disorder, and the decrease of thalamus and cerebellum fractional anisotropy is significantly related to the severity of obsessive-compulsive symptoms [9]. Cheng et al. found that the activity of anterior cingulate gyrus was enhanced and the activity of posterior cingulate gyrus was decreased in the resting state of obsessive-compulsive disorder, and the functional connection between the two was abnormal. These abnormalities affected the functional expression of obsessive-compulsive disorder [10].

The above research shows that abnormal activity and functional connectivity in multiple brain regions of obsessive-compulsive disorder may be an important mechanism for compulsive behavior and obsessive thinking. Therefore, the technology can provide reference for the differential diagnosis of obsessive-compulsive disorder and also become an important indicator for monitoring the therapeutic effect of obsessive-compulsive disorder.

1.3 Single Photon Emission Computed Tomography

Single-photon emission computed tomography (SPECT) uses isotopes to detect cerebral blood flow and directly reflects the structural and functional states of the brain. SPECT examination of 12 patients with obsessive-compulsive disorder found that the left anterior cingulate gyrus blood flow of patients with drug treatment symptom improvement was significantly reduced, while the cingulate gyrus blood flow of patients with obvious symptom onset was significantly increased [11]. Other studies show that, compared with the control group, the blood flow in part of frontal lobe, cingulate gyrus, thalamus, basal ganglia and cerebellar corpus callosum increases, while the blood flow in part of parietal lobe, occipital lobe and cerebellar vermis decreases [12]. Wen et al. believe that the local cerebral blood flow in basal ganglia and occipital lobe of obsessive-compulsive disorder has increased [13].

At present, the results of single photon emission computed tomography of obsessive-compulsive disorder are obviously inconsistent, and blood flow changes in different brain regions of different patients are also quite different. However, it is certain that blood flow abnormalities in multiple brain regions of these patients affect normal brain function and induce compulsive behavior. Clinically, the brain development of children and adolescents can be judged by SPECT examination as a whole, and the changes of brain function before and after treatment or training can be monitored.

1.4 Positron Emission Tomography

Positron emission tomography (PET) is a cutting-edge technology for studying the functional status of human body, which can display the subtle changes of tissue structure and functional status. Due to the high research cost, there are few related research reports. Some studies have shown that there are abnormalities in the frontal lobe, parietal lobe, cingulate gyrus, thalamus and other brain regions and cortex-striatum-thalamus-cortex loop of obsessive-compulsive disorder. attwells et al. found neuroinflammation in the basal ganglia of obsessive-compulsive disorder using trans locator protein (tspo) combined with positron emission tomography, and detected a significant increase in the distribution of positive locator protein in dorsal caudate, orbitofrontal cortex, thalamus, ventral striatum etc. [14].

The above research shows that abnormal brain region function and neuroinflammation may be one of the root causes of obsessive-compulsive thinking, obsessive-compulsive emotion and obsessive-compulsive thinking. Of course, there

are also positron emission tomography studies, which show that the structure and function of some brain regions in obsessive-compulsive disorder are not significantly different from those in the general population[15]. Therefore, when positron emission tomography is used in the study of obsessive-compulsive disorder, it is necessary to refer to the results of other research techniques to continuously improve the reliability of the study.

1.5 magnetic resonance spectroscopy study

Magnetic Resonance Spectroscopy-Copy (MRS) is a new non-invasive imaging technology, which reflects the metabolic level and functional status of brain tissue by measuring the changes of N-acetylaspartic acid, glutamic acid-glutamine complex, choline complex, creatine and other substances in living tissues such as brain. ljungberg et al. found that the concentration of n-acetylaspartic acid and choline complex in the caudate nucleus of the brain in obsessive-compulsive disorder children is relatively high, while the concentration of n-acetylaspartic acid and glutamic acid-glutamine complex in thalamus and occipital lobe is relatively low [16]. Mrs by Russell et al. reported that the concentration of n-acetylaspartic acid in the left dorsolateral prefrontal cortex of obsessive-compulsive disorder children was significantly increased [17]. Recent magnetic resonance spectroscopy studies have found that glutamate levels in thalamus of obsessive-compulsive disorder are abnormal, and the higher the glutamate concentration, the more serious the obsessive-compulsive thinking is, [18].

To sum up, the metabolism of N-acetylaspartic acid, glutamic acid-glutamine complex and other substances in the brain of obsessive-compulsive disorder has changed, which is the molecular biological explanation of the pathogenesis of obsessive-compulsive disorder and provides new ideas for the development of new drugs and the treatment of obsessive-compulsive disorder.

1.6 Biological research

Biological studies have shown that abnormalities in neurotransmitter metabolism, genetic genes and cytokines in patients with obsessive-compulsive disorder may be the deeper cause of the disease and provide more choices for more effective intervention.

2.1 Neurotransmitter Research

5-hydroxytryptamine (5-HT) is directly or indirectly involved in mood regulation. Studies have found that abnormalities in synthesis, metabolism, mediation and performance of serotonin receptor may lead to obsessive-compulsive disorder, and abnormal expression of serotonin receptor genes HTR2A and HTR2C are also suspicious factors for the occurrence of obsessive-compulsive disorder. Fu Huiqun et al. found that platelet serotonin concentration in obsessive-compulsive disorder children is lower than that in normal children [19]. Locher et al. have studied the efficacy and safety of selective serotonin reuptake inhibitors (SSRI) and serotonin-norepinephrine reuptake inhibitors (SEROTONIN-NOR EPINEPHRINE reuptake INHIB-ITORS, SNRI). The results show that the two inhibitors have significant efficacy and little side effect.

CAT ECHOL METHYL TRANS-FERASE (COMT) is a metabolic enzyme of central neurotransmitter and has the function of controlling dopamine and norepinephrine. There are research reports that one allele of catechol oxymethyl transferase in obsessive-compulsive disorder has been mutated, which reduces the activity of the enzyme and easily causes boys to suffer from obsessive-compulsive disorder [21].

However, some studies have found that OCD has nothing to do with catechol oxymethyl transferase [22], so further attention should be paid to relevant studies.

Other studies have explored the correlation between glutamic acid, dopamine and obsessive-compulsive disorder. Some studies have reported that the glutamic acid level in cerebrospinal fluid of obsessive-compulsive disorder is significantly higher than that of normal control group, and it is more obvious in male obsessive-compulsive disorder and early-onset obsessive-compulsive disorder, suggesting that the abnormality of glutamic acid pathway may be related to the onset of obsessive-compulsive disorder [23]. But Ortiz and other studies show that there is no significant difference between the concentration of glutamic acid complex and glutamine in the anterior cingulate cortex of obsessive-compulsive

adolescents and the normal population, [24]. Vermeire et al. found 9 cases of obsessive-compulsive disorder with abnormal ratio of dopamine transporter in left and right striatum [25] using animal model research. This research not only explains the pathogenesis of obsessive-compulsive disorder from an animal perspective, but also provides important enlightenment for pathophysiological research and drug intervention of human population with obsessive-compulsive disorder.

To sum up, most studies have confirmed that the neurotransmitters in obsessive-compulsive disorder are abnormal, and the imbalance of 5-hydroxytryptamine, dopamine and glutamic acid may be an important mechanism that causes the disorder, resulting in compulsive thinking and behavior. At the same time, inhibitors are widely used in the clinical practice of obsessive-compulsive disorder and have achieved good results. The detection of neurotransmitters provides a basis for the determination of dosage for different patients with the disease and the research and development of new drugs, long-acting drugs and better delayed-effect drugs.

2.2 Genetic research

In recent years, genetic research of obsessive-compulsive disorder has also attracted much attention, focusing on family genetic investigation and gene research. Family genetic survey includes family history survey, twins and foster children, etc. Hanna and others studied the confirmed OCD children and their family members, and found that 27 of 56 family members also suffered from OCD [26] ,which was obviously hereditary.

Hou et al. found that, compared with the control group, the functional connectivity of cortex-striatum-thalamus-cortex circuit and occipital cortex in patients with obsessive-compulsive disorder decreased, and the functional connectivity of bilateral caudate nucleus, left orbitofrontal cortex and left temporal gyrus in patients with obsessive-compulsive disorder and their first-degree relatives increased [27], suggesting that abnormal resting functional connectivity in these brain regions may be the intrinsic physiological mechanism of the onset of obsessive-compulsive disorder, which is of great significance for revealing the genetic mechanism of patients with obsessive-compulsive disorder. Van Groothest et al. reported that twins of 12-year-old, 14-year-old and 16-year-old adolescents have significant genetic effects of obsessive-compulsive disorder, but the prevalence rate of 12-year-old males and females is equivalent, and the prevalence rate of 14-year-old and 16-year-old girls is higher [28], which means that the genetic factors of obsessive-compulsive behavior may be gradually expressed with age. Bey et al. found that OCD patients and non-sick parents

All the families showed a high level of injury avoidance behavior, and the level of injury avoidance of children who had suffered adversity was much higher than that of their non-diseased relatives [29], which indicates that these groups are vulnerable.

Other studies have explored the relationship between dopamine receptor gene and obsessive-compulsive disorder, but there are few studies. For example, Gasso and other studies have shown that the polymorphism of dopamine transporter gene and dopamine D3 receptor gene in the right, left anterior and posterior cerebellar lobe of children and adolescents with obsessive-compulsive disorder is related to obsessive-compulsive disorder. [30]. More research is needed to support the relationship between dopamine receptor gene and obsessive-compulsive disorder.

Genetic studies show that obsessive-compulsive disorder has significant genetic effects, suggesting that people with family history of obsessive-compulsive disorder should pay attention to this problem in the process of marriage, gestation and offspring rearing.

2.3 Cytokine Study

Recent studies have found that primary obsessive-compulsive disorder may be an autoimmune disease, which is related to streptococcal infection, toxoplasma gondii infection or Borna virus infection, but the conclusion is not unified [31].

2.3.1 Interleukin-2

The research on interleukin (IL) and obsessive-compulsive disorder among cyIL-2 is a small molecule polypeptide synthesized by activated lymphocytes, which can stimulate HPA axis activity in vivo, participate in neurobiochemical,

endocrine and immune regulation, and has a wide range of pathophysiological effects.tokines has always been a hot topic. IL-2 is a small molecule polypeptide synthesized by activated lymphocytes, which can stimulate HPA axis activity in vivo, participate in neurobiochemical, endocrine and immune regulation, and has a wide range of pathophysiological effects. Liu liying et al. found that the serum il-2 level in the obsessive-compulsive disorder group was higher than that in the control group before treatment. the il-2 level in the obsessive-compulsive disorder group was significantly decreased after treatment. il-2 was positively correlated with obsessive-compulsive symptoms, indicating that the abnormal expression of il-2 was related to the severity of obsessive-compulsive disorder. [32]. However, some studies have proved that IL-2 has nothing to do with obsessive-compulsive disorder. For example, Simsek and other studies have found that although the level of IL-2 in children with obsessive-compulsive disorder is significantly higher than that in the control group, the severity of obsessive-compulsive disorder has nothing to do with the level of IL-2. [33].

2.3.2 Tumor Necrosis Factor-α

Tumor Necrosis Factor-α (TNF-α) is an important inflammatory medium, which not only participates in the regulation of individual immune function, but also plays an important role in the signal network regulation of immune-inflammatory coordination, and can also directly or indirectly affect the central nervous system through vagus nerve [34]. UGUZ et al. found that TNF-(level in umbilical cord blood of OCD pregnant women is significantly higher than that of healthy pregnant women, suggesting that high anxiety level of OCD mothers may lead to fetal cerebral neuroinflammation[35].

Simsek et al. found that the level of TNF-α in obsessive-compulsive disorder children was significantly higher than that in the control group, and the level of TNF-α was negatively correlated with clinical efficacy [33]. Other studies have shown that there is no correlation between TNF-α and obsessive-compulsive disorder. For example, Keszler and others have found no correlation between TNF-α gene polymorphism and obsessive-compulsive disorder group when comparing children with obsessive-compulsive disorder with control group. [36].

3. Cognitive behavior research

So far, the cognitive behavior research of obsessive-compulsive disorder mainly discusses the pathogenesis of obsessive-compulsive disorder from the perspectives of cognitive deviation, cognitive function and cognitive behavior therapy.

Functional disorder belief explains the mechanism of compulsive thinking from the perspective of cognitive bias. Among them, thought-action fusion is a form of dysfunctional beliefs, which is manifested in patients' difficulty in distinguishing subjective thoughts from objective reality. Excessive exaggeration of the effect of subjective assumptions on objective reality is an important psychological mechanism leading to forced thinking. Studies such as Muris show that OCD adolescents' thought-action fusion is significantly related to OCD symptoms. [37].

Some scholars also study the mechanism of OCD from the perspective of cognitive function. Lewin et al. used Rey-Ostrich Complex Graphics Test, California Speech Learning Test, DELIS-Kaplan Executive Function Test System, Memory and Learning Extensive Evaluation System to evaluate the executive function, memory and information processing speed of children and adolescents with obsessive-compulsive disorder. The results showed that children and adolescents with obsessive-compulsive disorder had defects in executive function, memory and attention, [38]. Li et al. tested with delayed memory tasks and found that patients with obsessive-compulsive disorder have defects in verbal and visual memory, showing problems such as delayed response, repetitive movements, difficulty in conversion, etc. [39]. Kashyap et al. tested with Wisconsin Card Sorting Test, the results showed that OCD patients scored significantly lower than the normal group, and they had defects in time planning, concept formation, decision-making and non-verbal memory coding, [40]. However, there are also research reports that there are no obvious defects in the cognitive function of patients with obsessive-compulsive disorder. For example, Abramovich et al. analyzed 227 cases of children and adolescents with obsessive-compulsive disorder in 11 documents. The results show that the patients have no obvious differences from the control group in planning, reaction inhibition/interference control, set shift/cognitive flexibility, verbal memory, nonverbal memory, information processing speed, working memory, visual space and attention function. [41]. There are also

studies that the traditional cognitive tests mentioned above have limitations and are not sufficient to describe the defects of specific cognitive functions of patients with obsessive-compulsive disorder and other mental diseases. New behavioral tasks and neuroimaging techniques may be needed to further explore the intrinsic mechanism of obsessive-compulsive disorder. [42].

In addition, there are also studies to prove the pathogenesis of obsessive-compulsive disorder patients from the perspective of cognitive behavioral therapy. Cognitive behavioral therapy is a common method of psychotherapy, which mainly solves the cognitive bias problem of obsessive-compulsive disorder patients and can supplement the cognitive behavioral theory of children and adolescents with obsessive-compulsive disorder. Vogel et al. conducted cognitive behavioral therapy on 4 patients with obsessive-compulsive disorder through video conference and telephone. The therapeutic effect was good and the symptoms of the patients were improved, [43]. Storch et al. conducted routine cognitive behavioral therapy and intensive cognitive behavioral therapy on patients with obsessive-compulsive disorder in groups. The results show that both therapies have achieved good therapeutic effects [44].

The above research shows that cognitive bias, basic cognitive ability and executive function defects of children and adolescents with obsessive-compulsive disorder may be the important reasons leading to compulsive thinking and behavior. Therefore, cognitive behavioral therapy for children and adolescents with obsessive-compulsive disorder is still an important means of intervention, which should be paid attention to and combined with drugs to treat the disease.

4. Summary and Enlightenment

The above results show that the research field of obsessive-compulsive disorder of children and adolescents is extensive, which also reflects the complexity and diversity of its pathogenesis.

Imaging studies show that there are abnormalities in brain structure and brain function of children and adolescents with obsessive-compulsive disorder. Diffusion Tensor Imaging, Positron Emission Tomography and Functional Magnetic Resonance Studies have found structural and functional abnormalities in multiple brain regions of children and adolescents with obsessive-compulsive disorder. Single photon emission computed tomography, functional magnetic resonance and magnetic resonance spectroscopy showed that cerebral blood flow and metabolic level of brain tissue in children and adolescents with obsessive-compulsive disorder were abnormal, and the study suggested that these abnormalities were closely related to the occurrence of the disease.

In biological research, there are abnormalities in neurotransmitters, genetic materials, cytokines and so on in children and adolescents with obsessive-compulsive disorder. Neurotransmitter studies have shown that there are varying degrees of abnormalities in serotonin, dopamine and glutamic acid in children and adolescents with obsessive-compulsive disorder. The above neurotransmitter imbalance may be an important factor leading to obsessive-compulsive thinking and behavior. Therefore, it is necessary to continuously monitor the abnormal indicators of neurotransmitters in children and adolescents with obsessive-compulsive disorder. Genetic studies have proved that obsessive-compulsive disorder has significant familial and twin genetic effects. Therefore, prevention should be emphasized. Cytokine research is a very forward-looking research field at present. Its research results in obsessive-compulsive disorder may have individual differences, but it does not affect treatment, and instead becomes an important indicator of personalized treatment. Studies suggest that obsessive-compulsive disorder may cause immune problems, which may be useful for prenatal and postnatal care, pre-pregnancy and pregnancy health care, detection and treatment of obsessive-compulsive disorder, and become a promising research direction in the future.

Cognitive behavior research holds that the cognitive function deviation of children and adolescents with obsessive-compulsive disorder is an important psychological mechanism for the occurrence of the disease. In addition, cognitive behavioral therapy based on this has also achieved some positive results, which provides important enlightenment for the intervention and treatment of children and adolescents with obsessive-compulsive disorder.

4.1 Enlightenment from Diagnosis and Evaluation

The above research results have important reference value for the diagnosis and evaluation of obsessive-compulsive

disorder children and adolescents.

First, the OCD children and adolescents should be evaluated and monitored by multiple means.

Children and adolescents diagnosed with obsessive-compulsive disorder should be tested and evaluated by various means, combining with medicine, biology, cognitive behavioral science, psychology and other disciplines. In addition, parents and educators of children and adolescents with obsessive-compulsive disorder should cooperate with medical institutions to feedback the situation of children and adolescents in time so as to effectively monitor the quality of their medication and intervention training, with a view to achieving positive and effective results in a shorter time.

Second, conduct various examinations and diagnoses on high-risk groups. Genetic studies have proved that obsessive-compulsive disorder has significant familial and twin genetic effects. Therefore, imaging, biology, cognitive behavior and other aspects of examination and diagnosis should be carried out for people with family genetic history and other high-risk groups.

4. 2 Enlightenment from Treatment and Intervention

The above researches on imaging, biology and cognitive behavior have achieved many valuable results, which provide important enlightenment for the treatment and intervention of obsessive-compulsive disorder children and adolescents.

First, change the original concept and strengthen the understanding of the sensitivity of the problem. Some external behaviors of children and adolescents with obsessive-compulsive disorder may sometimes be considered as [45] caused by individual's habits, persistence, will or emotions, but there are actually neurophysiological and pathological mechanisms. Therefore, relevant personnel should first change their original ideas, pay more attention to children and adolescents suspected of obsessive-compulsive disorder, and change their perspective of the problem. They should not think that obsessive-compulsive disorder is only a problem of habit or emotional behavior, or it may delay diagnosis and intervention.

Second, take active measures to intervene according to the existing research results. When children and adolescents with obsessive-compulsive disorder have compulsive behaviors or obsessive thinking, parents and teachers should intervene in them according to scientific methods, using technologies and methods including but not limited to the above. don't be too evasive, unwilling to admit or afraid of discrimination [46], and don't exclude drugs and other treatments, otherwise it may delay the condition of obsessive-compulsive disorder and further aggravate the risk.

Third, according to the characteristics of children and adolescents, create an effective teaching environment. When creating an environment for children and adolescents with obsessive-compulsive disorder, we should not only attach importance to this problem but also avoid it excessively. The ultimate goal of creating an effective environment is to enable children and adolescents with obsessive-compulsive disorder to successfully complete their studies and realize socialization under appropriate learning pressure and appropriate situations, while ensuring normal learning without inducing abnormal conditions.

Fourth, strengthen physical exercise, improve sleep quality and enhance immune function. This is the fundamental guidance for the treatment and intervention of children and adolescents with obsessive-compulsive disorder, and it is also a very important aspect. When exercising, the human body will produce hormones such as epinephrine, norepinephrine and cortisol [47], which can help children and adolescents with obsessive-compulsive disorder to adjust their emotional and behavioral states, overcome people's frustration, reduce inducing factors, and make them have better tolerance and resistance to adverse factors.

Fifth, strengthen propaganda and education work. Research shows that obsessive-compulsive disorder has certain heritability, so special educators should make use of their own work advantages to widely introduce some common knowledge about the examination, diagnosis, genetics and other aspects of obsessive-compulsive disorder to the society and surrounding people, so as to make more people understand obsessive-compulsive disorder and create a good community environment, family environment and learning environment for the later intervention and learning of children and adolescents with obsessive-compulsive disorder.

4.3 Enlightenment from Research

At present, some positive results have been achieved in the research on obsessive-compulsive disorder of children and adolescents, but most of them come from foreign research. The research in this field in our country needs to be further strengthened.

First, strengthen the research on cognitive behavior intervention. For children and adolescents with obvious symptoms of obsessive-compulsive disorder, cognitive behavioral intervention is still an effective intervention method, and good achievements have been made in this area at home and abroad.

Children and adolescents in China are affected by their studies, family structure and school education. Their cognitive and behavioral interventions may have their own characteristics and characteristics in China. Based on China's cultural background and cultural characteristics, we should research, design and develop more targeted specific interventions and activities.

Second, strengthen localization research and cooperative research. At present, most of the researches on obsessive-compulsive disorder are carried out by foreign researchers, and the researches in this field in China are relatively weak. Therefore, China's higher special education researchers, medical researchers, biological researchers and special children's physiological and pathological researchers should strengthen the study of obsessive-compulsive disorder of children and adolescents, and at the same time, should strengthen multi-agency and cross-disciplinary cooperative research, in order to understand the pathogenesis of obsessive-compulsive disorder of children and adolescents in China, in-depth diagnosis,

Research on the effectiveness of intervention techniques and evaluation methods of intervention effects.

Third, pay close attention to the research progress at home and abroad and update the existing methods in time. Education, medicine and other workers should pay close attention to the research progress of children and adolescents with obsessive-compulsive disorder at home and abroad, apply the existing research results to clinic in a timely manner, update the existing diagnosis, intervention and treatment measures and methods, improve the effect of effective intervention and treatment of children and adolescents with obsessive-compulsive disorder in China as soon as possible, improve their quality of life, avoid permanent injury, and reduce the burden and pressure on society, the country, families and individuals.

References

1. Geller D A. Obsessive - compulsive and spectrumdisorders in children and adolescents. Psychiatric Clinics of North America, 2006, 29 (2) : 353-370.
2. Franklin M E, Foa E B. Treatment of obsessive compulsive disorder. Annual Review of Clinical Psychology, 2008, 7 (5) : 229-243.
3. Villadsen A, Thorgaard M V, Hybel K A, et al. Health anxiety symptoms in children and adoles - cents diagnosed with OCD. European Child & Ad - olescent Psychiatry, 2016,85 (2) : 86.
4. Bloch M H, Landerosweisenberger A, Rosario M C, et al. Meta - analysis of the symptomstructure of obsessive - compulsive disorder. American Journal of Psychiatry, 2008, 165 (12) : 1532-1542.
5. Li Z Ji W, Li D, et a1.Microstructural abnor - mality in left nucleus accumbens predicts dysfunc - tional beliefs in treatment - resistant obsessive - compulsive disorder. Medical Science Monitor, 2014, (20) : 2275-2282.
6. Rosso I M, Olson E A, Britton J C, et al. Brain whitematter integrity and association with age at onset in pe - diatricobsessive - compulsive disorder. Biology of mood & anxiety disorder, 2014,4 (1) : 1-10.
7. Gan J, Zhong M, Fan J, et al.Abnormal whitematter structural connectivity in adults with ob- sessive - compulsive disorder. Translational Psy-chiatry, 2017, 7 (3) : 1062-1068.
8. Berlin H A, Stern E R, et al. Altered olfactoryprocessing and increased insulaactivity in patientswith obsessive - compulsive disorder: An fMRI study. Psychiatry Research, 2017, 262: 15-24.
9. Qiu L, Fu X S, Wang S, et al. Abnormal regionalspontaneous neuronal activity associated withsymptom severity in treatment - naive patientswith obsessive - compulsive disorder revealed byresting - statefunctional MRI. Neuroscience Let -ters, 2017, 640: 99-104.
10. Cheng Y, Xu J, Nie B, et al. Abnormal resting -state activities and functional connectivities of theanterior and the posterior cortexes in medication - naive patients with obsessive - compulsive disorder. Plots One, 2013, 8 (6) : 467-478.
11. Karadag F, Kal kan O N, Yuksel D, et al. Thecomparison of pre - and post - treatment (99 m) TcHMPAO brain SPECT images in patients with ob - sessive - compulsive disorder. Psychiatry Research, 2013, 213 (2) : 169-177.
12. Wen S L, Cheng M H, Cheng M F, et al. Phar - macotherapy response and regional cerebral bloodflow characteristics

in patients with obsessive - compulsive disorder. Behavioral & Brain Functions, 2013,9 (1) : 31-38.
13. Wen S L, Yue J H, Cheng M F, et al. Changecharacteristics of regional cerebral blood flow and curative efficacy in patients with obsessive - compulsive disorder. Zhonghua Yi Xue Za Zhi, 2012,92 (27) : 1866-1900.
14. Attwells S, Setiawan E, Wilson A A, et al. In - flammation in the neurocircuitry of obsessive - compulsive disorder. Jama Psychiatry, 2017, 56 (6) : 389-396.
15. Biver F, Goldman S, Francois A, et al. Changes in metabolism of cerebral glucose after stereotacticleukotomy for refractory obsessive - compulsive disorder: A case report. Journal of Neurology Neurosurgery & Psychiatry, 1995, 58 (4) : 502-505.
16. Ljungberg M, Nilsson M K, Melin K, et al. 1 Hmagnetic resonance spectroscopy evidence for oc - cipital involvement in treatment - naive paediatricobsessive - compulsive disorder. Acta Neuropsy-chiatrica, 2017, 29 (3) : 179-190.
17. Russell A, Cortese B, Lorch E, et al. Localized functional neurochemical marker abnormalities in dorsolat - eral prefrontal cortex in pediatric obsessive - compulsive disorder. Journal of Child & Adolescent Psycho - pharmacology, 2003, 13 (1) : 31-38.
18. Fan S, Cath D C, Van D H O A, et al. Abnor - malities in metabolite concentrations in tourette's disorder and obsessive - compulsive disorder - Aproton magnetic resonance spectroscopy study. Psychoneuroendocrinology, 2017, 77:211-217.
19. Fu Huiqun, Guo Min, Peng Xiaolan, et al. Comparative study of platelet serotonin concentration in children with obsessive-compulsive disorder and depression. Progress in Modern Biomedicine, 2010,10 (15): 2932-2934.
20. Locher C, Koechlin H, Zion S R, et al. Efficacy and safety of selective serotonin reuptake inhibi - tors, serotonin - norepinephrine reuptake inhibi - tors, and placebo for common psychiatric disorders among children and adolescents: A systematic review and meta - analysis. Jama Psychiatry, 2017, 74 (10) : 1011-1020.
21. Noshirvani H F, Kasvikis Y, Marks I M, et al. Gender - divergent aetiological factors in obsessive - compulsive disorder. British Journal of Psychiatry the Journal of Mental Science, 1991, 158 (3) : 260-263.
22. Poyurovsky M, Michaelovsky E, Frisch A, et al. COMT Val 158met polymorphism inschizophre - nia with obsessive - compulsive disorder: A case - control study. Neuroscience Letters, 2005, 389 (1) : 21-24.
23. Longjiang, Wang Guoqiang. Current status of gene research on glutamate pathway in obsessive-compulsive disorder. International Journal of Psychiatry, 2013, (1): 43-45.
24. Ortiz A E, Ortiz A G, Falcon C, et al. 1 HMRS of the anterior cingulate cortexin childhood and adolescent obsessive - compulsive disorder: A case - control study. European Neuropsychophar-macology, 2015, 25 (1) : 60-68.
25. Vermeire S, Audenaert K, et al. Serotonin 2Areceptor, serotonin transporter and dopaminetransporter alterations in dogs with compulsive behaviour as a promising model for human obsessive -- compulsive disorder. Psychiatry Research, 2012, 201 (1) : 78-87.
26. Hanna G L, Veenstra-Vanderweele J, Cox N J, et al. Genome - wide linkage analysis of families with obsessive - compulsive disorder ascertainedthrough pediatric probands. American Journal of Medical Genetics, 2002, 114 (5) : 541-552.
27. Hou J M, Zhao M, Zhang W, et al. Resting statefunctional connectivity abnormalities in patients with obsessive-compulsive disorder and theirhealthy first - degree relatives. Journal of psychi-atry & Neuroscience, 2014, 39 (5) : 304-311.
28. Van Grootheest D S, Bartels M, Van Being-jsterveldt C E M, et al. Genetic and environmental contributions to self - report obsessive - compulsive symptoms in dutchadolescents at ages 12, 14 and16. Journal of the American Academy of Child & Adolescent Psychiatry, 2008, 47 (10) : 1182-1188.
29. Bey K, Lennert L, Riesel A, et al. Harm avoidance and childhood adversities inpatients with obsessive-compulsive disorder and their unaffected first -- degree relatives. Acta Psychiatric Scandinavica, 2017, 135 (4) : 328-338.
30. Gasso P, Ortiz A E, Mas S, et al. Association between genetic variants related to glutamatergic, dopaminergic and neurodevelopment pathways and white matter microstructure in child and adolescent patients with obsessive - compulsive disorder. Journal of Affective Disorders, 2015, 186:284-292.
31. Luciana F, Christopher P. Microglialdysregula-tion in ocd, tourette syndrome, and PANDAS. Journal of Immunology research, 2016, (2) : 1-8.
32. Liu liying, Jia balin, Huang ziye. Changes of brain-derived neurotrophic factor and interleukin in patients with depression and obsessive-compulsive disorder complicated with pulmonary tuberculosis. Chinese journal of nosocomiology, 2015, (10): 2182-2184.
33. Seref Simsek，Yüksel T， im A，et al．Serumcy - tokine profiles of children with obsessive - compulsive disorder shows the evidence of autoimmunity. International Journal of Neuropsychopharmacolo - gy, 2016 (3) : 1-6.
34. Hou R, Garner M, Holmes C, et al. Peripheralinflammatory cytokines and immunebalance ingeneralised anxiety disorder: Case-controlledstudy. Brain Behavior & Immunity, 2017, 62 (5) : 212-218.
35. Uguz F, Sonmez E O, Sahingoz M, et al. Neu - roinflammation in the fetus exposed to maternal obsessive - compulsive disorder during pregnancy: A comparative study on cord blood tumor necrosisfactor - alphalevels. Comprehensive Psychiatry, 2014, 55 (4) : 861-865.
36. Keszler G, Kruk E, Kenezloi E, et al .Association of the tumor necrosis factor - 308A/G pro - moter polymorphism with Tourette syndrome. International Journal of Immunogenetics, 2015, 9 (6) : 493-498.

37. Muris P, Meesters C, Rassin E, et al. Thought - action fusion and anxiety disorders symptoms innormal adolescents. Behaviour Research & Therapy, 2001, 33 (7) : 6, 843-852.
38. Lewina A B, Larson M J, Park J M, et al. Neu - ropsychological functioning in youth with obsessive compulsive disorder: Anexamination of executivefunction and memory impairment. Psychiatry Research, 2014, 216 (1) : 108-115.
39. Li B, Sun J H, Li T, et al. Neuropsychological study of patients with obsessive compulsive disorder and their parents in China: Searching for potential endophenotypes. Neuroscience Bulletin, 2012, 28 (5) : 475-482.
40. Kashyap H, Kuma rJ K, Kandavel T, et al. Neuropsychological functioning in obsessive - compulsive disorder: Are executive functions thekey deficit. Comprehensive Psychiatry, 2013, 54 (5) : 533-540.
41. Abramovitch A, Abramowitz J S, Mittelman A, et al. Research review neuropsychological testperformance in pediatric obsessive - compulsive disorder - a meta - analysis. Journal of child psychology & psychiatry, 2015, 56 (8) : 837-847.
42. Gruner P, Pittenger C. Cognitive in flexibility inobsessive - compulsive disorder. Neuroscience, 2017, 345: 243-255.
43. Vogel P A, Launes G, Moen E M, et al. Video - conference - and cell phone - based cognitive - behavioral therapy of obsessive - compulsive disorder: A case series. Journal of Anxiety Disorders, 2012, 26 (1) : 158-164.
44. Storch E A, Geffken G R Merlo L J, et al. Family - based cognitive - behavioral therapy for obsessive - compulsive disorder: Comparison of intensive and weekly approaches. Journal of the American Academy of Child & Adolescent Psychiatry, 2007, 46(4) : 469-478.
45. Zhao Hui, Yan Jun, Zhong Zhong. A Study on Self-identity and Security of Obsessive Compulsive Disorder Patients. Chinese Journal of Behavioral Medicine and Brain Science, 2012, 21 (12): 1101-1103.
46. Li Huajing, Zhan Chaoyong, Liu Yujun, etc. A Survey of Parents' Personality of Obsessive Compulsive Disorder Patients in Shaoguan City. Nursing Research, 2009, 23 (30): 2733-2734.
47. Yi Xuejie, Chang Bo and Huang Chaoqun. Exercise hormones and immunity. Sports Research, 1997, (4): 32-35.