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Contents

Article

- 1 Teaching Research and Reform of Higher Vocational Medical Education in Guizhou Province of China**
Wan Ding Jicheng Lin Jianhui Yang Xianming Cao Fang Cao Shaomei Lu
- 8 Effect of Warm Acupuncture on “Dinghui Acupoint” and “Heart Acupoint” in Traditional Mongolian Medicine on Behaviors and Hypothalamic Inflammatory Cytokines in Rats with Chronic Fatigue Syndrome**
Shumei Bai Ling Shui Qin Si Yingsong Chen
- 14 IVF Development and Analysis of Neonatal Conditions**
Tian Tian Weixin Huang
- 18 FOXM1 and UBE2C are Distinct Biomarkers for Non-small Cell Lung Cancer Survival Prediction: Data-mining Based on ONCOMINE**
Ya Wang Jiang Zhu
- 25 Application of Seamless Nursing Management in Emergency-ICU Patient Safety Transfer and Handover**
Qian Wang Lili Wei

Review

- 29 The Application of Theoretical Models in the Studies of Physical Activity Behaviors of the Elderly in China**
Yuquan Chen Yuqi Wang Fanxuan Meng Zifei Du Qun Zuo
- 34 The Progress of the General Prevention and Treatment of Pediatric Caries in China**
Jinping Liu



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ARTICLE

Teaching Research and Reform of Higher Vocational Medical Education in Guizhou Province of China

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ABSTRACT

With the development of Guizhou's economy and society, higher vocational medical education in Guizhou has developed rapidly, making it its mission to cultivate practical and skilled talents oriented to the grassroots and serving for frontline. However, due to the social environment, policy environment and insufficient funding, many difficulties and problems are faced. It is necessary to have a unified management throughout the province, rationally lay out higher vocational colleges and specialties, and promote the healthy and rapid development of medical higher vocational education in Guizhou with advanced concepts, proper policies, and sufficient funds in place, making higher vocational medical education in Guizhou enter a benign development period.

1. Introduction

With the rapid development of the country, a large number of application-oriented and operation-oriented talents are needed. Higher vocational medical education is part of higher education. In the process of massification and popularization of higher

education in China, higher vocational medical education plays a pivotal role, which cultivates a large number of high-quality application-oriented talents for the country with the aim of cultivating practical and skilled talents oriented to the grassroots and serving for frontline. In recent years, the school size and student enrollment number of higher vocational colleges have expanded rapidly. How-

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ever, at present, higher vocational medical education has certain problems in terms of school regulations, school characteristics, school management, school hardware and software conditions, teaching quality, specialty settings and curriculum arrangements. In order to better grasp the development opportunities and make higher vocational medical education in Guizhou enter a benign development period, this paper attempts to start from the development status of higher vocational education in Guizhou to explore and discuss the countermeasures to promote the reform and development of higher vocational medical education in Guizhou.

2. The Development Status and Training Modes of Higher Vocational Education in Guizhou

2.1 Lack of Connotation Development

Higher vocational education in Guizhou Province started in 1998, from the organization and establishment originated from general universities and colleges, the restructuring of adult colleges, the merger of secondary schools in various regions, and the upgrading of secondary or secondary vocational schools, developing to where it is today. It can be said that the platform for higher vocational education in Guizhou has been basically completed. However, it is not optimistic that there are not many large-scale medical vocational colleges. Although the scale of higher vocational education has developed, the connotation adapting to it has shown obvious deficiencies. The main performances are: the scale of higher vocational colleges is small, the number of higher vocational students is small, there is still a big gap compared with ordinary higher education. Compared with the situation in which higher vocational education accounts for half of the higher education all over China, it is far from the situation. And many higher vocational colleges include general higher education, general secondary education and secondary vocational education. Pure higher vocational education does not have an absolute advantage.

Since many higher vocational colleges are reformed or upgraded from other school forms, they are inherently inadequate in terms of higher vocational education thoughts, infrastructures, practical training conditions, and faculty levels. After establishment, the capital investment is seriously insufficient, and the concept change is not in place, so that education and teaching cannot reach their goal of cultivating high-quality application-oriented talents. Higher vocational education organized by vocational and technical colleges subordinated from some general colleges and universities has become a compression education of

general undergraduates. The proportion of practical training in teaching plans is too small, and the skills are cultivated in a single way. The teaching is still based on the related disciplines and the theoretical teaching is the main body, ignoring the cultivation of vocational skills, which cannot reflect the characteristics of higher vocational education; some of the upgraded higher vocational colleges have turned higher vocational education into a magnified and even repetitive education for secondary vocational education. In the same school's teaching plan, the difference between secondary vocational education and higher vocational education is only reflected in the amount of courses, while the differences between knowledge structure and skill structure cannot be reflected.

The products of higher vocational colleges are students. The ability of students to serve the society is an embodiment of the school's ability and an important indicator of the school's comprehensive strength, which can indirectly reflect the maturity of the school's specialty construction and the closeness to the related industries and society. The reality shows that the level of higher vocational education in Guizhou is not high, the characteristics of vocational education are not obvious, and the quality needs to be improved.

2.2 The Characteristics of Vocational Education Need to Be Strengthened Urgently

Lack of overall planning in specialty setting and development, although the specialty is developing rapidly, the repetition is serious. Many schools have computer majors, accounting majors, and tourism majors, but some specialties are still seriously lacking. The characteristic specialties and specialty advantages of schools are not strong, and the market competitiveness is weak. With the full implementation of the Poverty Alleviation Program and the adjustment of the national industrial structures, the forefront of production requires a large number of application-oriented talents. Obviously, Guizhou lacks a specific overall planning guidance for the specialty settings and construction to meet the needs of higher vocational talents in Guizhou's social and economic development. There is still a gap between the training of application-oriented talents in higher vocational colleges and social development needs in Guizhou.

2.3 The Education Concepts Need to Be Strengthened Urgently

Due to the backward education concepts on education system and school management, many colleges have unreasonable curriculum settings. The performance is as follows: the course structure is single, the content is outdated, the order of the courses is not reasonable, and the links

between the courses are not close; the teaching channels are single, and most of them still follow the single traditional mode of class teaching. The individual differences of students are difficult to take care of, which limits the development of students' personality; the teaching methods lack innovation, and the "teaching plus examination" constitutes the main body of teaching activities, which ignores the improvement of students' quality and the cultivation of innovation ability.^[1]

In addition, the teaching evaluation system is simple. The evaluation of students is over-emphasizing test scores, and the examinations and tests are still the only magic weapon for teachers to evaluate students, which ignores the development and evaluation of students' innovative ability. This single form is not conducive to examining the overall quality of students, and is not conducive to the cultivation of the independence and creativity of students. Besides, the evaluation method for teachers is single and the content is not reasonable. It is difficult to truly judge the level and achievements of teachers.

2.4 Traditional Higher Vocational Medical Education Focuses on Classroom Teaching while Operating Ability Is Poor

After the students graduated to work, lots of knowledge has to be re-learned, the practicality is not targeted, the learning is out of touch, and some students' employability is poor, which is far from the characteristics of modern vocational education, and the ability to adapt to job needs is weak.

3. New Policy and Talent Requirements of the Country for Modern Vocational Education and Teaching

The strategic deployment of the "Deepen Comprehensive Reform in the Field of Education" adopted by the 19th National Congress of the Communist Party of China puts forward new requirements for the continuous promotion of the scientific development of higher education and the overall improvement of the quality of talent cultivation. To implement the spirit of the 19th National Congress of the Communist Party of China, we must intensify efforts to deepen the reform of education and teaching, innovate the training mechanism for talents in universities and colleges, and comprehensively improve the quality of talent cultivation.

3.1 Innovate System and Mechanism, Establish a "Comprehensive Education Concept", and Explore Diverse Talent cultivation Modes

It is necessary to focus on the core elements of talent cul-

tivation objectives, curriculum system, teaching methods, teaching evaluation, and teaching environment. Vigorously promote the integration of the curriculum system and teaching contents, implement the teaching method reform oriented by students' independent learning and active practice, and establish a diverse, individualized and open education system. Construct an educational and teaching environment that is conducive to the development of students' comprehensive ability and individuality. It is necessary to follow the law of talent growth and in light of the actual situation of the school, constantly explore and improve various types of talent cultivation modes, and take the connotative development path with quality as the core.^[2]

3.2 Optimize the Curriculum System, Promote the Reform of Teaching Methods, and Construct a Reasonable Curriculum and Practical Teaching System

It is necessary to rationally design the curriculum structure according to the talent cultivation objectives, and combine the specialty training standards to construct a curriculum system with specialty core courses as the mainstay, and to do a good job of the "Double Basic" (basic knowledge points and basic skills) of specialty knowledge. According to specialty needs, the curriculum system should be integrated and adjusted, the teaching content should be reformed, and the characteristics of professional talents should be highlighted. Teachers should be encouraged to adopt heuristic, inquiry, discussion, and participatory teaching methods, focusing on cultivating students' independent learning ability to raise, analyze, and solve problems, and inspiring students' thinking potential. Strengthen the construction of teaching resources, establish a platform for teaching resources sharing, and promote the opening of quality educational resources, such as quality online open courses. Support teachers to use the network education platform and other modern educational technologies and means to carry out teaching activities and improve the quality of multimedia teaching. Actively promote the reform of the curriculum evaluation method, combine the learning process examination with the student ability evaluation, which not only comprehensively evaluates the knowledge acquisition, exploration research, innovative thinking and other aspects of the learning process, but also evaluates the basic knowledge and key content requirements of the syllabus. For classroom teaching, Confucius-type Classroom (knowledge-driven, teacher-initiative, and students-active) Socrates-type Classroom (problem-driven, student-initiative, and teacher-student interaction), Flipped Classroom (MOOC online-learning, classroom- questioning), Independence Classroom (in-

interesting target-driven, autonomous & conscious-active, curricular & extracurricular-linkage) and other forms of classroom teaching should be used flexibly according to different teaching contents.^[1] As the distribution center of ideas, models and mechanisms, the focus of reform is to start from the classroom and the curriculum reform. The classroom is the home of all education reforms. All reform ideas and measures must go to the classroom to reflect the efficiency and results.^[3] There are methods of teaching, but no fixed rule of teaching. The methods and means to improve the quality of teaching are diverse and systematic. It is necessary to teach according to different disciplines, different courses, different contents, and different objects. As long as it is conducive to enhancing the teaching effect and improving the quality of teaching, it is a good method; any classroom that achieves knowledge, enlightens wisdom, and develops abilities, it is a good classroom.^[4]

3.3 Focus on the Mutual Promotion of Scientific Research and Teaching

Make full use of the faculty and experimental conditions to strengthen the construction of courses and teaching materials. Focus on timely integration of the latest scientific research results into the classroom teaching contents, so that students can know about the academic frontiers. Promote improvement in teaching conditions through scientific research. Introduce high-quality educational resources, grasp and follow the general direction of higher education development.

3.4 The Renewal and Development of Modern Vocational Education Thoughts and the Transformation of Modern Medical Models

With the renewal and development of modern vocational education thoughts and the transformation of modern medical models, its influence is gradually infiltrating into education and teaching, which requires all educators to pay more attention to the combination of society and individuals; pay more attention to the penetration of humanistic spirit in science and technology education; pay more attention to quality education; pay more attention to the main role of students and the ability to analyze and solve problems; pay more attention to specialty technology and skills education, and better serve the society. Do a good job of “Six Dockings”, that is, “the docking between occupational ethics education and comprehensive quality standards; the docking between specialties and related industries, enterprises and posts; the docking between specialized course contents and occupational standards;

the docking between teaching process and productive process; the docking between academic certificates and occupational qualifications; the docking between vocational education and lifelong education docking”.^[5]

4. Favorable Conditions and Restrictive Factors for the Development of Higher Vocational Medical Education in Guizhou

With the gradual improvement of the policy environment and social environment, the introduction of “New Medical System Reform Scheme”, the vigorous development of general medicine and community health services, the demand for talents in society and the market has steadily increased, and a large number of health technicians are required at the grassroots level. There is a large space for the development of higher vocational medical education in Guizhou. In the 8 specialties or specialty demonstration groups that have been established, the degree of development varies. For example, the two specialties of nursing and clinical medicine are relatively mature; while for the two specialties of medical imaging technology and medical beauty technology, the development history of these two specialties is relatively short, the specialty core construction workload is large, which is still in the exploration stage. The direction of medical imaging technology social services should be oriented to the industry, and the development of service projects is difficult. The potential social training demand for the specialty of medical beauty technology is relatively large, but there are many social training institutions. Therefore, the development of school projects must create brands and highlight features.

The development of the local economy and the intrinsic advantages of medical vocational education have significantly improved the students’ admission rate, registration rate and employment rate. As far as our school is concerned, the registration rate in these years has reached 85%, and other peer colleges are similar, which shows that the social recognition rate of higher vocational medical education has improved. In particular, with the implementation of a series of policies (such as the implementation of the occupational qualification access system), it will bring good development opportunities and favorable conditions for higher vocational medical education.

On the other hand, the restrictive factors for the development of higher vocational medical education in Guizhou are: late start, low starting point, insufficient capital investment, low faculty levels, poor training conditions, outdated education concepts, backward education and teaching level, and further improvement of talent quality is needed.

Due to historical and practical reasons, the funds for higher vocational education in Guizhou are insufficient. The normal operation of higher vocational colleges relies mainly on the original foundation, limited social financing and tuition income below the cost of education, and is stretched in terms of teacher training and training base construction. The faculty members engaged in higher vocational education have low academic qualifications, low professional titles, and there are few “double-certificated teachers”, so that available teachers still have single knowledge structure, and weak practical ability, which cannot adapt to the new situation requirements in terms of how to cultivate practical innovative talents.^[6]

5. Thoughts and Suggestions on Teaching Reform of Higher Vocational Medical Education in Guizhou

Teaching work is always the central task of the school. The quality of teaching is always the lifeline of the school. It is the eternal theme of the school to cultivate innovative qualified talents. All reforms must be innovated and carried out around above three aspects.

5.1 From the Aspect of Schools

5.1.1 Practically Change Ideas

Clarify the nature and essence of education, which is the high moral values establishment and people cultivation. Students are trained to have “independent personality, the spirit of exploration, the ability to learn, and the capability to practice”, so that students can form correct values, outlook on life, and worldview. Therefore, every vocational education worker should be a conscious and sober educator.

5.1.2 Effectively Optimize the Operating Environment of Higher Vocational Education, Increase Propaganda Work, and Promote Educational Informationization

As a kind of education, higher vocational education, due to the late start and limited conditions for school-running, people generally attach importance to general higher education and despise vocational and technical education. There are even thoughts and awareness of despising vocational education in the society and even in the education circles. Some local governments and functional departments also have insufficient understanding of the status and role of higher vocational education. Due to the low social recognition rate and insufficient social support, there are “Three Lows” phenomena of low starting point

of students, low registration rate and low employment rate, which have seriously affected the normal development of higher vocational education. Therefore, we should increase the propaganda work of higher vocational education from the school-running level, school-running characteristics, training objectives and employment prospects, etc., especially for some good vocational colleges to be established as a model to let people change their concepts about higher vocational education, fully understand the role and status of higher vocational education in the country’s economic and social development, and thus establish a good image. At the same time, the employment information channels for higher vocational students and students are opened, so that higher vocational education can find a broader development space in the social environment with open information. At the same time, the enrollment and employment information channels for higher vocational students should be opened, so that higher vocational education can find a broader development space in the social environment with open information.

5.1.3 Strengthen and Improve Students’ Understanding of National Vocational Qualification Certification System and Labor Employment Access System

The implementation of the vocational qualification certification system has created a good employment environment for vocational students. If a strict labor employment access system is implemented, no one can be employed without training or without the related qualification certificates, which will be greatly beneficial to higher vocational education, so that the advantages of higher vocational education can be fully reflected. As long as the employment position access policies are actively developed and implemented, a virtuous circle will be established among vocational and technical education, position qualification training and employment.

5.1.4 Build High-quality Teachers and Management Teams

Adjust the policy of teacher title evaluation in higher vocational colleges and establish a high-quality team of teachers with higher vocational characteristics. Due to the distinctive characteristics of higher vocational education teaching, it is necessary to adjust the evaluation scale from over-emphasizing the academic theoretical level and research ability of teachers to paying more attention to the knowledge transfer ability and knowledge conversion ability of higher vocational teachers. Therefore, a set of policies should be established to meet the qualifications of teachers with higher vocational education characteristics,

and then paving the way for the establishment of a “double-certificated teachers” team to provide system guarantee for ensuring the implementation of higher vocational characteristic education.

5.2 From the Aspect of Government

Strengthen government’s policy management of higher vocational education, and do well in top-level design as follows:

5.2.1 Do Well in the Scale and Enrollment Control of Higher Vocational Colleges

Avoid the vicious competition brought about by blind expansion and the decline in the level of school-running. Reduce the battle for student enrollment between schools, making higher vocational education in Guizhou develop moderately.

5.2.2 Support Higher Vocational Colleges with Good Conditions to Improve the Status of Higher Vocational Education

Build the brand of higher vocational colleges to fully demonstrate the connotation and advantages of higher vocational education, thereby improving the status and reputation of higher vocational education, and gradually promote the overall level of school-running through the construction of model higher vocational colleges.

5.2.3 Improve the Education Level of Vocational Colleges, Consummate the Vocational Education System, and Do well in Lifelong Education

In the vocational education system, there are only vocational high schools, vocational technical schools or secondary technical schools and higher vocational colleges. After that, it is difficult to have the opportunity to further study. This kind of capping method of vocational education is not conducive to the further study and development of higher vocational students, which is also not conducive to cultivating high-level application-oriented talents. At present in Guizhou, the proportion of secondary vocational education entering to higher vocational education is about 50%; and the proportion of higher vocational education entering to general higher education is less than 10%. The proportion is too small to meet the students’ needs for study, so that higher vocational education becomes the end of education. Therefore, vocational and technical undergraduate courses should be set up in qualified vocational and technical colleges to enroll students of four-year undergraduate or higher vocational students for further study, increase the proportion of students from higher

vocational education entering to general higher education, and truly build a vocational education system from primary to intermediate to advanced.

5.2.4 Build Open-type Practical Teaching Bases through Co-construction of Both the Government and Colleges on the Stage Offered by the Government

For higher vocational colleges, practical teaching conditions are the fundamental guarantee for the quality of education and characteristic teaching. For a long time, the school’s funds are tight, the equipment is rudimentary, and the update is not timely, and it cannot meet the needs of practical teaching of higher vocational education. How to build a practical teaching base? What kind is it? How to use it? It has been plaguing vocational and technical colleges. We believe that the government should invest in guiding funds, and then enterprises and schools invest in multiple fields, and establish several high-level practical teaching bases according to the industry characteristics and specialty advantages of different colleges. In addition to meeting the teaching needs of the college, it should be managed by the college and is open to the outside on the basis of the principle of mutual benefit. There are many experiences in other provinces that are worth learning.

5.2.5 Strengthen the Government’s Macro-control, Use System to Monitor the Teaching Quality and Use Policies to Guide the School-running Characteristics

The government functional department should establish a scientific evaluation system to evaluate the enrollment system, teaching organization, curriculum system, practical teaching, evaluation system and student employment; organize experts to review the teaching plans of higher vocational colleges, and comprehensively monitor the scale, structure, quality and effectiveness of higher vocational education; develop quantitative standards for the characteristic education of higher vocational education, so as to promote the improvement of teaching quality and the substantial development of higher vocational education characteristics.

5.2.6 Use Policy and Financial Advantages to Encourage the Development of Specialties in Short Supply

It is necessary to have a concept of unified management throughout the province in the construction of higher vocational specialties, starting from the overall situation of the provincial economic development, formulate pref-

erential policies, use government subsidies to guide and encourage, and develop the “unpopular” specialties in society, especially the technological specialties that are in short supply.

6. Conclusion

In summary, comprehensively deepening the reform of education and teaching is the key to improving the quality of talent cultivation. This requires us to closely focus on the needs of society and the needs of students’ comprehensive development, guided by advanced education concepts, and based on the construction of teachers, deepen the reform of education and teaching management, strengthen the cultivation of students’ ability, and comprehensively deepen the comprehensive reform of education and teaching.

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ARTICLE

Effect of Warm Acupuncture on “Dinghui Acupoint” and “Heart Acupoint” in Traditional Mongolian Medicine on Behaviors and Hypothalamic Inflammatory Cytokines in Rats with Chronic Fatigue Syndrome

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ABSTRACT

Objective: To observe the effects of warm acupuncture on “Dinghui Acupoint” and “Heart Acupoint” in Traditional Mongolian Medicine on behavior and hypothalamic inflammatory cytokines IL-1 β , IL-6 and IFN-r in Rats with Chronic Fatigue Syndrome. **Methods:** SD rats were randomly divided into normal group, model group, warm acupuncture group and moxibustion positive control group. The latter three groups of rats were used to establish a model of rats with chronic fatigue syndrome (CFS) using a combination of physical fatigue and mental fatigue. When establishing the model of warm acupuncture group, “Dinghui Acupoint” and “Heart Acupoint” intervention was carried out; when establishing the model of moxibustion positive control group, “Zusanli Acupoint” intervention was carried out on both sides. Behavioral observations (body weight, exhaustive swimming time, tail suspension experiment, water maze) were performed before and after modeling. The hypothalamic inflammatory cytokines IL-1 β , IL-6 and IFN-r were detected by ELISA method after warm acupuncture and moxibustion intervention. **Results:** After 21 days of modeling, the body weight of the rats in each group was significantly lower than that in the normal group, and there was a significant difference ($P<0.01$); Compared with the model group, the weight of the rats in the warm acupuncture group increased significantly, and there was a significant difference ($P<0.01$); Compared with the model group, the exhaustive swimming time of the rats in the warm acupuncture group was significantly prolonged, and there was a significant difference ($P<0.01$); Compared with the moxibustion group, the exhaustion time of the rats in the warm acupuncture group was relatively prolonged, and there was a significant difference ($P<0.05$); Compared with the normal group, the tail suspension time of the model group was significantly prolonged, and there was a significant difference ($P<0.05$); Compared with the model group, there was a significant difference in the duration of the suspension of the warm acupuncture group and the moxibustion group ($P<0.01$); Compared with the normal group, the total distance of the water maze test was shorter in the model group, and there was a significant difference ($P<0.01$); Compared with the model group, both the warm acupuncture group and the moxibustion group were prolonged, and there was a significant difference ($P<0.05$); Compared with the moxibustion group, the distance between the rats in the warm acupuncture group was relatively longer, but there was no significant difference ($P>0.05$); Compared with the normal group, IL-1 β , IL-6 and IFN-r increased significantly in the model group and there was a significant difference ($P<0.05$); Compared with the model group, IL-1 β and IL-6 in the warm acupuncture group was significantly decreased ($P<0.05$), and the IL-6 in the moxibustion group was significantly different ($P<0.05$); Compared with the model group, there was no significant difference between the IFN-r group and the moxibustion group ($P>0.05$); Compared with the moxibustion group, the levels of IL-1 β , IL-6 and IFN-r were not significantly different ($P>0.05$). **Conclusion:** Warm acupuncture on “Dinghui Acupoint” and “Heart Acupoint” in Traditional Mongolian Medicine has the ability to improve the body’s defense and self-healing ability, improve chronic fatigue syndrome (CFS), and thus play a preventive role. The results of this research indicate that the warm acupuncture group and the moxibustion group have the same effect.

1. Introduction

Chronic fatigue syndrome (CFS) is characterized by long-term mental fatigue and physical fatigue as clinical manifestations of clinical syndrome, often accompanied by headache, sore throat, muscle and joint pain, memory loss, hypothermia, depression and other neurological symptoms, and no organic lesions. CFS is easy to occur in people between the ages of 30 and 50. The course of disease lasts for several months to several years. Although many people can continue to work, their work ability and efficiency are obviously reduced, and the symptoms of fatigue are not alleviated by rest. CFS has become a common sub-health state in modern society, and its incidence is gradually increasing. Relevant experts believe that this disease will be the “invisible killer of health” in the 21st century and is one of the main problems affecting human health. CFS is mainly caused by a variety of stressors in daily life that can trigger the body's stress response,^[1] resulting in a variety of tissue and organ disorders in the body characterized by fatigue.^[2] The currently accepted view is that the neuroendocrine system changes under stress, and in addition to the hypothalamic-pituitary-adrenal axis, macrophage inflammatory cytokines in the immune system are also involved in the stress response. These cytokines can affect the neuroendocrine system and work together to complete the stress response. Pall^[3] and others believe that inflammatory cytokines are closely related to the pathology of patients with CFS. Western medicine has no specific drugs, mainly to relieve clinical symptoms and the treatment effect is not good. This research group has been devoted to the research of this disease from the perspective of Mongolian medicine for many years. It is concluded that Mongolian medicine warm acupuncture treatment can better improve the clinical symptoms of CFS patients.^[4,5] Further research and observation based on the basic research has been carried out

to observe the mechanism of action and effect of treatment of CFS by warm acupuncture on “Dinghui Acupoint” and “Heart Acupoint”, and compare it with moxibustion in Traditional Chinese Medicine, the results are as follows.

2. Materials and Methods

2.1 Animals and Grouping

SD male rats, clean grade, weighing 160-180g, 48 rats, provided by Beijing Weitong Lihua Animal Experiment Co., Ltd. (license number: SCXK (Beijing) 2016-0011). Forty-eight rats were weighed and weighed from small to large. They were divided into four groups, 12 rats in each group, and then 48 pairs of random numbers were used to match four groups. According to the pairing numbers, the group of 3 groups in each group from small to large was divided into four groups, namely normal group, model group, warm acupuncture group and moxibustion group, 12 in each group. The indoor temperature is maintained at 20-26 °C, the relative humidity is 40%-70%, and the feeding is adapted for 3 days before the experiment, free diet and feeding.

2.2 Main Equipment

MYL-I type temperature needle instrument: Inner Mongolia Yuanyang Zhongmeng Medical Technology Development Co., Ltd. Special silver needle: 0.5*3cm, Ai grain: 7mm*8mm is provided by Beijing Zhongtitai Medical Co., Ltd. Suspension box: height 60cm width 40cm depth 50cm, according to the relevant literature. Water Maze Instrument: WMT-100, provided by Chengdu Taimeng Technology Co., Ltd. Bucket: 100cm deep and 50cm in diameter, stopwatch, electronic scale, thermometer, etc.

2.3 Model Preparation

After adapting to the environment for 3 days, the model

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group, warm acupuncture group and moxibustion group rats were placed in a bucket for 3 days of swimming, once a day, once for 20 minutes, and two rats were bathed once a bucket, the water depth was 80 cm. The water temperature is $30\pm 2^{\circ}\text{C}$. Then on the fourth day, the official weight-bearing swimming (weight is 5% body weight, body weight is weighed every 3 days) for 21 days. When the rat does not move on the surface of the water, it is driven by a wooden stick to maintain its exercise state. Exhaustive standard: the swimming movement is obviously out of tune, and can no longer be adhered to. When the nose sinks into the water for 5 seconds, it cannot be returned to the surface of the water as exhaustion. When the animals appear exhausted, they should be picked up in time, dried with a cloth, and rested in a cage.

2.4 Methods

Regular feeding in the normal group; the model group was modeled according to the preparation conditions. The warm acupuncture group “Dinghui Acupoint” and “Heart Acupoint” were treated alternately with warm acupuncture every other day. The two points are obliquely inserted into the needle, and the special acupuncture needle of Mongolian medicine is used, the depth is 0.5-1.0cm, the temperature is 100mA, and the temperature is 40°C . Each time 20min, the course of treatment is 21 days, Dinghui Acupoint 6 times, Heart Acupoint 5 times, a total of 11 times. The moxibustion group was treated with moxibustion on both sides of the Zusanli, 20 minutes each time, 3 times on one side, 6 times in total, the course of treatment was 21 days, and the treatment was performed every other day for 11 times.

2.5 Behavioral Detection Method

During the modeling period, the rats were generally weighed on the 21st day, the swimming exhaustion time was recorded, and the tail suspension experiment and the water maze test were performed. The hanging tail experiment method was to stick with a medical tape 1 cm away from the tail end of the rat, and hung in the center of the tail box to observe the immobility time within 5 minutes. The water maze experiment recorded the distance traveled in the sink in 3 minutes.

2.6 Material Drawing and Testing

On the 22nd day after the behavioral test of each group of rats, the rats were fasted for 24 hours, the hypothalamus was taken off the head, and the tissue was placed in a cryogenic vial for testing. The levels of IL-1 β , IL-6 and IFN- γ in the hypothalamus were detected by ELISA and

operated according to the instructions of the ELISA kit.

2.7 Statistical Methods

SPSS22.0 statistical software was used for data processing. The data values of measurement data were expressed by $\bar{X}\pm S$. One-way analysis of variance was used among multiple groups. The homodyne LDS and the variance of Dunnett T3 were compared with $P < 0.05$.

3. Results

3.1 General Situation

There were no significant differences in feed intake, water intake, body weight, and fur gloss of the four groups before the experiment. After the experiment, the normal group showed normal behavior and the body weight increased significantly compared with that before the experiment. The rats in the model group showed typical “fatigue” characteristics before the experiment: the mental state was not good, the drinking water was small, the stool was not formed, the fur fell off, the gloss is obviously reduced, the activity is reduced, and the blinking is lazy, lethargy, irritability, unresponsiveness, and significant weight loss. The amount of food and water in the warm acupuncture group and the moxibustion group were generally lower than those in the normal group and increased compared with the model group. In the middle of the two groups, the skin gloss was poor and the stool was normal.

3.2 Changes in Behavior of Rats in Each Group

3.2.1 Comparison of Body Weight before and after the Experiment in Each Group of Rats (see Table 1)

Table 1. Comparison of Body Weight before and after the Experiment in Each Group of Rats (Units: g, $\bar{X}\pm S$)

Group	N	1 st Day	21 st Day
Normal Group	10	209.36 \pm 8.53	323.60 \pm 11.57
Model Group	10	212.91 \pm 8.10	304.70 \pm 6.52**
Warm Acupuncture Group	10	211.00 \pm 8.18	328.10 \pm 9.48##
Moxibustion Group	10	208.58 \pm 8.28	317.40 \pm 23.04
F		0.93	5.18

Notes: ** $P < 0.01$ compared with the normal group, ## compared with the model group, $P < 0.01$.

It can be seen from Table 1 that there was no significant difference in body weight between the groups before the model establishment ($P > 0.05$). Compared with the normal group, the weight of the model group was significantly lower than that of the normal group ($P < 0.01$). Compared with the model group, the weight of the warm acupuncture

ture group increased significantly, and there was a significant difference ($P<0.01$); Compared with the moxibustion group, the weight of the warm acupuncture group was relatively increased, but there was no significant difference ($P>0.05$).

3.2.2 Comparison of Exhaustion Time before and after the Experiment in Each Group of Rats (see Table 2)

Table 2. Comparison of Exhaustion Time before and after the Experiment in Each Group of Rats (Units: s, $\bar{X}\pm S$)

Group	N	1 st Day	21 st Day
Model Group	10	858.58±165.24	201.00±87.88
Warm Acupuncture Group	10	884.83±499.23	639.90±378.07** [△]
Moxibustion Group	10	857.83±318.01	348.40±188.90#
F		0.02	8.03

Notes: ** Compared with the model group, $P<0.01$, # compared with the warm acupuncture group, $P<0.05$, [△] compared with the moxibustion group, $P<0.05$.

Since the normal group did not perform adaptive swimming, the swimming data was not exhausted. It can be seen from Table 2 that there was no significant difference in exhaustive time between the groups before the model establishment ($P>0.05$). Compared with the model group, the swimming time of the warm acupuncture group was significantly prolonged, and there was significant difference ($P<0.01$). Compared with the moxibustion group, the swimming time of the warm acupuncture group was relatively extended. And there was a significant difference ($P<0.05$).

3.2.3 Comparison of the Tail Suspension Time before and after the Experiment in Each Group of Rats (see Table 3)

Table 3. Comparison of the Tail Suspension Time before and after the Experiment in Each Group of Rats (Units: s, $\bar{X}\pm S$)

Group	N	1 st Day	21 st Day
Normal Group	10	50.33±34.39	81.20±20.24
Model Group	10	49.50±22.06	116.40±63.36*
Warm Acupuncture Group	10	47.17±22.04	62.20±16.38##
Moxibustion Group	10	48.50±18.82	51.60±35.04##
F		0.39	5.48

Notes: * $P<0.05$ compared with the normal group, ## compared with the model group, $P<0.01$.

It can be seen from Table 3 that there was no significant difference in the time of suspension of the rats in each group before modeling ($P>0.05$). Compared with the normal group on the 21st day of modeling, the immobil-

ity time of the model group was significantly prolonged, and there was significant difference ($P<0.05$). Compared with the model group, the warm acupuncture group and the moxibustion group had no significant movement time. Shortened, there was a significant difference ($P<0.01$).

3.2.4 Comparison of the Total Distance of the Water Maze before and after the Experiment in Each Group of Rats (see Table 4)

Table 4. Comparison of the Total Distance of the Water Maze before and after the Experiment in Each Group of Rats (Units: cm, $\bar{X}\pm S$)

Group	N	1st Day	21st Day
Normal Group	10	2960.76±801.66	2277.70±233.02
Model Group	10	2905.62±517.25	1597.57±244.84**
Warm Acupuncture Group	10	3129.17±501.47	2154.02±468.01#
Moxibustion Group	10	3040.21±866.73	2003.53±251.19#
F		0.24	8.83

Notes: ** $P<0.01$ compared with the normal group, # $P<0.05$ compared with the model group.

It can be seen from Table 4 that there is no significant difference in the total distance of water maze between the groups before the modeling ($P>0.05$). Compared with the normal group on the 21st day of modeling, the total distance of the rats in the model group was significantly reduced ($P<0.01$). Compared with the model group, the total distance of the warm acupuncture group and the moxibustion group increased. There was a significant difference ($P<0.05$).

3.2.5 Comparison of Inflammatory Cytokines in Hypothalamic Tissue of Rats in Each Group (see Table 5)

Table 5. Comparison of Inflammatory Cytokines in Hypothalamic Tissue of Rats in Each Group (Units: pg/ml, $\bar{X}\pm S$)

Group	N	IL-1 β	IL-6	IFN- γ
Normal Group	10	30.66±17.71	113.36±57.47	45.67±18.09
Model Group	10	58.48±21.02*	159.70±44.17*	72.17±16.22*
Warm Acupuncture Group	10	33.29±7.53#	112.98±30.58#	56.02±28.33
Moxibustion Group	10	36.85±13.19	113.96±34.56#	54.92±22.01
F		6.54	2.90	2.32

Notes: * $P<0.05$ compared with the normal group, # $P<0.05$ compared with the model group.

It can be seen from Table 5 that the levels of IL-1 β , IL-6 and IFN- γ in the hypothalamus of the model group were significantly increased compared with the normal group on the 21st day of modeling, and there was a sig-

nificant difference ($P < 0.05$). Compared with the model group, the levels of IL-1 β and IL-6 in the warm acupuncture group were significantly lower, there was a significant difference ($P < 0.05$), and there was no significant difference in IFN- γ content ($P > 0.05$). Significant difference ($P < 0.05$); there was no significant difference in the warm acupuncture group compared with the moxibustion group.

4. Discussion

In the modern efficient and fast-paced lifestyle and high-intensity work competition environment, not eating or drinking too much on time, preferring cold, spicy things, or emotional disorders, overwork, lack of exercise, and long-term physical and mental activity. Such causes cause a decrease in the body's basal metabolic rate and chronic inflammation. In recent years, it has been pointed out that patients with CFS have abnormal immune function, and cytokines are closely related to the appearance of CFS symptoms. It is believed that chronic immune activation can lead to increased release of cytokines, and highly expressed pro-inflammatory cytokines disrupt neurotransmitter function, resulting in CFS fatigue, muscle pain, sore throat, swollen lymph nodes and other symptoms appear.^[6] IL-1 β and IL-6 are among the most important cytokines and play an important role in the bidirectional regulation of neuro-endocrine-immune system stress response. IL-1 β regulates adrenocorticotrophic hormone in the hypothalamus in a stress response, and can also directly act on the pituitary to promote the secretion of adrenocorticotrophic hormone. Conversely, glucocorticoids can also reverse the secretion of IL-1 β .^[7] The research found that normal rats do not contain IL-1 β in the blood or the content is very low, and elevated IL-1 β indicates tissue damage or infection in the body.^[8] IL-6 is considered to be a fatigue-inducing cytokine. The pro-inflammatory factors IL-1 β , IL-6 and IFN- γ are involved in the formation of chronic inflammation and can trigger fatigue, depression and flu-like symptoms in patients with similar CFS. IL-6 is mainly involved in adaptive immune regulation and is affected to some extent by IL. The effect of -1 β secretion, while elevated IL-6 levels were observed in most chronic inflammation, showing that IL-6 response may be more pronounced in chronic inflammation caused by chronic stress.^[9,10,11] IFN- γ is a multi-functional cytokine produced by activated T lymphocytes, which can enhance the cytotoxic activity of natural killer cells (NK), activate phagocytosis of macrophages, and enhance the body's non-specific immune system. Functional disease resistance, which in turn promotes B cell differentiation, produces antibodies, ultimately kills microorganisms, and plays an important role in antiviral and immune function.

IL-1 β , IL-6 and IFN- γ act as pro-inflammatory cytokines not only involved in the regulation of body fever, feeding, sleep, arousal, etc., but also induce mental and neurological symptoms such as apathy, fatigue, and delusions.

Traditional Mongolian Medicine believes that the occurrence and development of diseases are always closely related to psychological factors, social factors, environmental factors and physical factors. Mongolian Medicine categorizes chronic fatigue syndrome in the category of Badakan and Hershey diseases, and believes that Badakan in the "Three Roots" (Heyi, Sheila, Badakan) is in a state of peace with Hershey, Heyi and Badagan are dysfunctional, causing a series of syndromes such as persistent or recurrent fatigue.^[12] Therefore, in clinical practice, the disease is often treated by inhibiting the increase of "Hervey" and performing the function of Badakan. Traditional Mongolian Medicine warm acupuncture therapy has the effects of improving blood circulation, reducing inflammation and relieving pain, relieving cold and dispelling cold, regulating Badagan, Heri dysfunction, and improving the body's disease resistance. Modern medical experiments have shown that the in vitro needle temperature measured by heating the silver needle tail is about 100°C, the needle body temperature in the skin is 55°C, and the tip temperature is 39-41°C.^[13] This kind of thermal energy and acupuncture stimulation is an effective means to stimulate the body to produce benign stress. It can activate the endogenous protection mechanism of the body, adjust the body, reduce or resist the damage of subsequent diseases, and achieve the protection of the body. Based on the theory of Mongolian medicine and the concept of syndrome differentiation caused by three (Hervey, Sheila, Badakan) disorders, this experiment puts forward the intervention of CFS Mongolian doctor warm acupuncture to explore the possible mechanism and effect of Mongolian doctor warm acupuncture on CFS rats.

5. Conclusion

The results of this research indicate that in this experiment, the exhaustive swimming time of the model group was significantly shortened and the weight was reduced on the 21st day after exhaustive (weight-bearing) swimming modeling. The total distance of the water maze test was significantly shortened, and the suspension time was significantly prolonged. (Compared with the normal group, the model group had significant differences ($P < 0.05$, $P < 0.01$), and it was this change that corroborated the success of the model. The warm acupuncture group and the moxibustion group were exhausted. The swimming time, the water labyrinth experiment, the suspension time and the model group were significantly different, and there

was statistical significance ($P < 0.05$), indicating that the warm acupuncture treatment group and the moxibustion treatment group all reached a certain degree of fatigue relief. To reduce the damage caused by fatigue to the immune system. The results of this experiment also indicated that the levels of IL-1 β , IL-6 and IFN- γ in the hypothalamus of the model group were significantly increased ($P < 0.05$, $P < 0.01$); compared with the model group, the levels of IL-1 β and IL-6 in the warm acupuncture group and the moxibustion group were significantly lower ($P < 0.05$), and there was no significant difference in IFN- γ content ($P > 0.05$); there was no significant difference in the warm acupuncture group compared with the moxibustion group, which indicates that warm acupuncture treatment as an effective means of benign stress, inhibit the release of cytokines, improve the disease resistance and self-healing ability of rats, reduce or resist the damage of rats after fatigue, and thus play a preventive and therapeutic role. This may be one of the mechanisms by which the Mongolian doctor warm acupuncture therapy intervenes in CFS. The results of this research also indicate that the effect of warm acupuncture therapy is not better than that of moxibustion; further research is needed.

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ARTICLE

IVF Development and Analysis of Neonatal Conditions

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ABSTRACT

This paper first discusses the developmental origin of IVF (In vitro fertilization) and analyzes the four generations of IVF technology in detail. Then, combined with its own work experience, it discusses the neonatal situation of IVF, in order to improve reference for other medical staff.

1. The Development Origin of IVF

The research and development of IVF technology can be traced back to the middle of the 20th century. The original purpose of this kind of assisted reproductive technology research is to better contraception. In this process, people have studied the ovulation cycle and inheritance of mammals. The content of learning, embryology, etc., finally got the key content of the female egg cell development cycle. At first, the scientists at that time speculated that the female egg cell development cycle only required a false conclusion of 12h, which led to serious obstacles and blows to the in vitro fertilization experiment. It was not until 1965 that scholars pointed out that human and some mammalian egg cells have a fixed developmental time (37h). Subsequently, the application and research of gonadotropins in other countries further promoted the progress of IVF. Superovulation is induced by ovulation drugs, and the control of egg cell maturation

time is achieved by using drugs such as clomiphene citrate and stimulating hormone, which makes it easier to grasp the timing of egg retrieval. This method is called controlled superovulation.^[1] In addition, advances in egg retrieval technology have also played an important role in promoting the development of IVF. The use of laparoscopic technologies to achieve egg retrieval can reduce the trauma caused to women. The appearance of pyruvate has effectively improved the effect of in vitro embryo culture and greatly promoted the development of IVF technology.

2. The Development History of IVF

In 1978, the world's first IVF baby was born in the UK, bringing the gospel to infertility patients. IVF is not really a growing baby in a test tube, but is artificially in vitro fertilized in the laboratory by taking a large amount of ovum from the female ovary. And bred it into an early embryo, and then transplanted back to the mother uterus at the appropriate time to further develop and grow the

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baby. Research on IVF has continued for several decades, during which time the development of IVF technology has gone through four generations, where the four generations of IVF technology are explained in detail.

2.1 First Generation IVF (IVF-ET)

The first generation of IVF includes in vitro fertilization and embryo transfer, which is the most basic assisted reproductive technology for IVF. This technology covers a wide range of subjects such as embryology, micromanipulation, and endocrinology, through human intervention. The form solves the infertility caused by the problem of female uterus endometriosis and tubal occlusion, and realizes the reproduction of human beings. At the same time, the first pregnancy rate of the first generation of IVF technology was less than 3%. With the maturity of biotechnology and the improvement of cell nutrient solution, coupled with the continuous enrichment of medical staff, the success rate of IVF in recent years. Increase to 20% to 30% or even higher than the success rate of natural conception. The first generation of IVF is commonly used in infertility caused by female reasons. It has no good solution to male problems such as weak, abnormal, and azoless, which is also its shortcoming. The first IVF baby in mainland China was born in 1988 at Peking University Third Hospital.

The IVF technology requires several steps. First, biological means is required to promote superovulation in women, followed by removal of ovum and sperm, in vitro fertilization, and embryo transfer after a period of culture. In order to improve the success rate of this technology, it is necessary to obtain as many healthy and mature ovum and a large number of sperm as possible, and after in vitro fertilization, a plurality of embryos are cultured, and 2 to 3 excellent embryos are implanted from the mother. At a time when embryo freezing and thawing technology has been widely developed, women can choose this technology to preserve mature ovum or embryos, so that the re-transplantation will not be successful due to the fact that the fertilized eggs are not implanted. The success rate of the first generation of IVF will be affected by maternal health status, age and history of abortion and the increase in age is inversely proportional to the success rate of IVF

2.2 Second Generation IVF (ICSI)

The academic name of the second generation of IVF is intracytoplasmic sperm injection. Many people think that the second generation of IVF is the evolution of the first generation of IVF, which is better than the first generation of IVF technology. In fact, the second generation of IVF is mainly developed for the problem of male sperm fertilization ability. The second generation of IVF technology is to extract

sperm from the epididymis, or to obtain sperm through testicular tissue sectioning method, and then inject single male sperm into the cytoplasm of egg cells by single sperm microinjection technology, thereby achieving egg cell fertilization and breeding into embryos. The subsequent steps are the same as the first generation, so the success rate of ICSI technology and IVF technology is not much different. Under normal circumstances, the fertilization process of the natural physiological state is competitive. Only the sperm that undergoes the acrosome reaction can fuse with the egg, and the egg membrane is induced to harden to prevent other sperm from entering. ICSI technology does not have a competitive process of sperm, which leads people to worry about sperm quality. In 2006, the emergence of PICS technology improved this situation. Hyaluronic acid is the main component of egg cells, which can screen sperm quality and improve the quality of sperm entering the egg cell. The PICS technology refers to the combination of hyaluronic acid in a culture dish, the addition of sperm obtained by puncture, and subsequent selection of sperm bound to the droplets to achieve screening of high-quality sperm. Studies have shown that hyaluronic acid can exclude sperm with abnormal chromosomes or genes, and DNA strand breaks and other conditions appear less, which is conducive to promoting sperm maturation. ICSI technology can solve the infertility of male weak sperm, abnormality, azoospermia, abnormal sperm acrosome, etc., and promote the application of IVF more widely.^[2] The second generation of IVF was successfully conceived in Belgium in 1992. The first second-generation IVF in China was born in 1996 at Zhongshan Medical University.^[3]

2.3 Third Generation IVF (PGD/PGS)

The third generation of IVF is a preimplantation genetic diagnosis technology that enables genetic diagnosis and screening of in vitro fertilized embryos, selecting the highest quality embryos, and preventing the birth of a fetus with a genetic defect. The PGD technology mainly consists of two steps. One is a biopsy, which refers to the aspiration of cells during a part of the embryonic development (the cleavage phase and the vesicle phase) to be examined; the other is genetic diagnosis, which is a genetic problem such as single-gene genetic disease or chromosomal abnormality by technologies such as polymerase chain reaction (PCR) to achieve embryo screening.^[4] PGD technology can not only solve the problem of infertility, but also bring about a major change in improving the quality of birth. At the same time, the third generation of IVF technology can also analyze the sex of the embryo, but in general, Chinese doctors will not inform the sex of the fetus, and will only be obliged to inform couples in-

volved in sexual chromosome diseases. Therefore, China has a higher screening requirement for couples applying for the third generation of IVF. At present, diseases that can be circumvented by PGD technology include cystic fibrosis, hemophilia A, and myotonic dystrophy. The technology is still developing, and it is believed that in the near future, it will be able to judge more genes and chromosomal diseases and contribute to the improvement of China's reproductive quality.^[5]

2.4 Fourth Generation IVF

The fourth generation of IVF is a domestic name for the technology of cytoplasmic replacement, and it has also become a three-tube IVF technology. Since the chromosome in the nucleus is the genetic material of the human gene, it plays an important role in determining the genetic characteristics of the offspring and maintaining the life activities of the cell. The cytoplasmic replacement technology refers to the realization of the nucleus replacement between aging ovum and vigor ovum, forming a new ovum, which still expresses the genetic characteristics of aging ovum. This technology is mainly applied to older women. Because of their older age, if they use their own egg cells, they may affect the quality of the embryo. By borrowing the follicle cytoplasm of young women, the quality of the embryos carrying both husband and wife can be greatly improved. The success rate of IVF is increased. However, although most of the genetic information of ovum is located in the nucleus, there is also human genetic information in the cytoplasm of the follicle, and it is also possible to write into the genetic sequence of the embryo. Therefore, although this technology has been gradually implemented in countries such as Japan and the United Kingdom, since China is a traditional socialist country, it is very important to ethics. This technology is likely to cause serious ethical and legal problems, and may also have a serious impact on the social atmosphere, so the technology has not been promoted and applied in China.

3. The Analysis of IVF Neonatal Conditions

With the development of IVF technology, because IVFs usually need to transplant 2~3 embryos during embryo transfer to increase the success rate of test tubes as much as possible, the IVF rate is higher. At the same time, since the embryo needs to be cultured in vitro for a period of time after transplantation, the quality of the culture medium in vitro and related environmental factors may affect the development of the embryo, which may lead to a lower birth weight, perinatal complications, and birth defects in IVF neonates than in naturally conceived infants.^[6] Relevant scholars at home and abroad pay more attention to

the birth quality of IVF, and their research conclusions are different. Combining my many years of work experience, the author summarizes the conditions of newborn birth and analyzes the reasons, in order to provide reference for other medical staff.

3.1 The Observation Method of Neonatal Conditions

Randomly select 100 newborns of IVF babies who were born in our hospital in 2018 and stay in our hospital, as well as 100 newborns with natural pregnancy and delivery that were born in our hospital and stay in our hospital. Record in detail the birth status and information, and observe and count the indicators such as Apgar score, birth defects, and neonatal complications, and draw conclusions.

3.2 Neonatal Asphyxia

There was no significant difference in neonatal Apgar scores, mean weight, hospitalization, neonatal malformations, and mortality between the single-fetal infants and the natural twins. Neonatal asphyxia occurred in only 3 of 100 single-child single-birth babies, and 10 cases of spontaneous births in single-child babies. It can be seen that the neonatal asphyxia is mainly due to the hypoxia of the mother uterus, hypoxia during labor, or the imperfect lung development and insufficient surfactant.

Because of the hard-won achievements of IVF newborns, it is also called precious baby. Pregnant women have been strictly pregnant during pregnancy and prenatal examination since pregnancy, to prevent all kinds of accidents, so as to effectively prevent uterus hypoxia during pregnancy. The situation happened. During the delivery of precious baby, the mother is usually hospitalized in advance and highly valued by the obstetrician. Once the production process is hypoxic, it can be discovered in time and properly treated and treated by the doctor. It can also effectively prevent neonatal asphyxia. Some pregnant women who give birth naturally may not receive systematic pregnancy care and prenatal examination, thus losing the best time to deal with fetal suffocation. This is also the main reason why the neonatal asphyxia rate of IVF babies in this hospital is lower than that of natural delivery babies.

3.3 Neonatal Preterm Birth Rate, Hospitalization and Birth Weight

Since assisted reproductive technology usually transplants multiple embryos to ensure the success rate of IVF, the twin pregnancy rate of IVF is 20 times higher than that of natural childbirth. Twins will cause greater intrauterine pressure on the mother uterus. At the same time, nutritional needs have also increased, resulting in premature

birth rate of IVF higher than that of natural delivery babies. Twins are an important cause of preterm birth, and preterm birth is the main cause of neonatal hyperbilirubinemia and low birth weight.

3.4 Neonatal Birth Defects

Neonatal birth defects refer to the embryos being affected by adverse factors during the process of gestation, resulting in congenital physiological structural malformations or disorders and systemic disorders in the development of normal embryos.^[7] Congenital birth defects are not only indicative of birth babies, but also natural abortions and stillbirths. Relevant surveys have shown that pregnant women who use IVF technology have a 20% to 30% higher risk of spontaneous abortion than women with natural pregnancy, which is related to the relatively large age of IVF women. According to the analysis of the follow-up data of the IVF infants born in our hospital, the total birth defect rate of IVF was 0.88%, and the incidence of congenital heart disease was 0.23%. In recent years, the incidence of birth defects in infants born with natural pregnancy has increased from 0.86% in 1995 to 2.08% in 2004. The incidence of congenital heart disease in natural gestational infants is 0.8% to 1.3%, indicating that the application of IVF technology does not increase the incidence of neonatal birth defects.^[8]

3.5 Neonatal Complications

According to the comparative analysis of IVF and natural delivery babies in our hospital, it is concluded that the complications of venous respiratory system, sepsis, neonatal anemia and jaundice and the mortality rate are higher than those of natural delivery babies. However, after the twins were excluded, the perinatal complications of IVF were similar to those of natural delivery babies. At the same time, during the investigation, it was found that neonatal complications were closely related to the age of the pregnant woman, the gestational age and whether the pregnant woman had pregnancy-induced hypertension. At present, many scholars blame the neonatal complications on neonatal premature birth, twins, and pregnancy-induced hypertension. Both premature birth and pregnancy-induced hypertension are associated with twins, and it can be considered that reducing twin pregnancies significantly reduces the incidence of neonatal complications. In addition, if the twin-pregnant women can get adequate nutrition guarantee during pregnancy, and receive the system of pregnancy care and prenatal examination, timely give the lung-promoting medicine before the premature delivery, which can effectively avoid respiratory diseases caused by neonatal lung hypoplasia, thus effectively

reducing the incidence of death and asphyxia caused by complications.^[9] Therefore, improving the perinatal nutrition supply and obstetric care of pregnant women and women is an important prerequisite for reducing the complication rate and mortality of newborns.

4. Conclusion

IVF technology has gone through four generations of technology since its inception, and it has been repeatedly questioned by various circles in the development process. Only strengthen the research and development of IVF technology, strictly control the indications of IVF, improve the quality of embryo culture in vitro, and reduce the rate of multiple pregnancies as much as possible, so as to effectively improve the fertility quality of IVF, promote family happiness, social stability and national prosperity.

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ARTICLE

FOX M1 and UBE2C Are Distinct Biomarkers for Non-Small Cell Lung Cancer Survival Prediction: Data-Mining Based on ONCOMINE

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ABSTRACT

Non-small cell lung cancer (NSCLC) remains to be primary reason of tumor deaths in the past few decades. The mortality of this malignancy could be reduced by developing new prognostic biomarkers and discovering novel therapeutic biological target. Here, we studied the mRNA expression of FOX gene family and UBE2C in different types of cancer compared with normal tissue through ONCOMINE differential analysis. CCLE analysis was mined to explore the expression profiles of target genes in different tumor cells. GEPIA was used to discover the expression of target genes in different subtypes and the correlations with lung cancer stage. The prognostic values of FOX M1 and UBE2C were further investigated through Kaplan-Meier plotter analysis. It showed that FOX A1, FOX D1 and FOX M1 were dramatically high expressed in NSCLC comparing with normal lung tissues. Besides, the expression of FOX M1 was significantly associated with UBE2C. Furthermore, the overexpression of FOX M1 and UBE2C were correlated to shorter survival in lung adenocarcinoma (LAC) instead of lung squamous cell carcinoma (LSCC). Hence, we could draw a conclusion that FOX M1 and UBE2C are distinguished biomarkers and crucial prognostic indicators for lung adenocarcinoma patients.

1. Introduction

Carcinoma of the lungs is the leading cause of tumor mortality around the world and about 80–85% of lung cancers are NSCLC consisted of large-cell carcinoma, lung adenocarcinoma (LAC) and lung squamous cell carcinoma (LSCC).^[1] It is notable that the 5-year survival rate has remained at ~17% over previous decades.^[2] Moreover, as the symptoms associated with

lung cancer are often non-specific, it is frequently diagnosed in the advanced stages.^[3] Therefore, it is required to develop new prognostic biomarkers and discovering novel therapeutic biological target.

The human FOX (Forkhead box) gene family is a key regulatory transcription factor family, composed of 19 subgroups and 50 members, named from FOX A1 to FOX S1.^[4] Fox family genes control the expression of other genes by regulating the activity of transcription factors,

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regulating the growth, differentiation, apoptosis, proliferation, migration, invasion and angiogenesis of tumor cells.^[5] FOXM1, as one of the most widely investigated gene from the FOX gene family, is a transcription factor overexpressed in various of tumor cells such as breast carcinoma, ovarian cancer, gastric and other cancers.^[6,7] It plays a vital role on stimulating cell proliferation through cell cycle progression and transcriptional regulation of important genes for G1/S and G2/M phase transition and M phase progression.^[8] It is reported that the poor prognosis in glioblastoma patients was related to FOXM1 gene overexpression.^[9] Therefore, FOXM1 is likely to be an important prognostic biomarker in NSCLC patients.

Recently, it was shown that UBE2C expression was transcriptionally regulated by FOXM1 in esophageal squamous cell cancer and the regulation may be a widespread phenomenon in human tumor.^[10] UBE2C/UBCH10, as an E2 ubiquitin-conjugating enzyme, plays an important role on regulation mitosis and cell cycle.^[11] It has been indicated that UBE2C was overexpressed in a range of tumor and associated with poor prognosis in several types of cancer including ESCC and colorectal cancer.^[12,13] These findings revealed that UBE2C is likely to be oncogene in lung cancer.

In the current study, we examined the expression of FOX gene family and UBE2C in different types of cancer compared with normal tissue, with purpose of determining the expression levels of FOXM1 and UBE2C and the correlations between FOXM1 and UBE2C, along with their corresponding prognostic significance in NSCLC.

2. Material and Methods

2.1 ONCOMINE Databases

ONCOMINE database (www.oncomine.org), an open and convenient online cancer microarray database, integrated 715 datasets and 86,733 samples. It is a powerful web application through which mRNA expression levels of FOXM1 and UBE2C in a large volume of cancer types, subtypes, and experiments were explored. Significant correlations between gene and cancer can be shown in a special figure. Co-expressed disease-related genes can also be mined through this database.

2.2 CCLE (Cancer Cell Line Encyclopedia) Analysis

The Cancer Cell Line Encyclopedia (CCLE) (<https://portals.broadinstitute.org/ccle/>), as a newly developed website, provides analysis tools including integrative genomics viewer (IGV), differential expression analysis, gene co-expression, gene set enrichment analysis (GSEA). The

CCLE enables public access to genomic data, analysis and visualization for about 1000 cell lines.

2.3 GEPIA (Gene Expression Profiling Interactive Analysis)

Gene expression profiling interactive analysis (<http://gepia.cancer-pku.cn/>), an open interactive web server, provides customized functions such as tumor/normal differential expression analysis, profiling plotting according to cancer types or pathological stages, patient survival analysis and so on. This is a time-saving and intuitive tool integrated approximately 9,736 tumors and 8,587 normal samples from the TCGA and the GTEx projects.^[14]

2.4 The Kaplan-Meier Plotter

The Kaplan Meier plotter (<http://kmplot.com/analysis/>), an online database including 2,437 lung cancer patients and 54,675 genes from GEO, EGA and TCGA, is capable to assess relapse free and overall survival^[15]. Patients were split into two cohorts by gene expression and were compared by a Kaplan-Meier survival plot, through which prognostic values of FOXM1 and UBE2C expressions were estimated. The hazard ratio with 95% confidence intervals and logrank P value are calculated. The difference was statistically significant in P-value < 0.01.

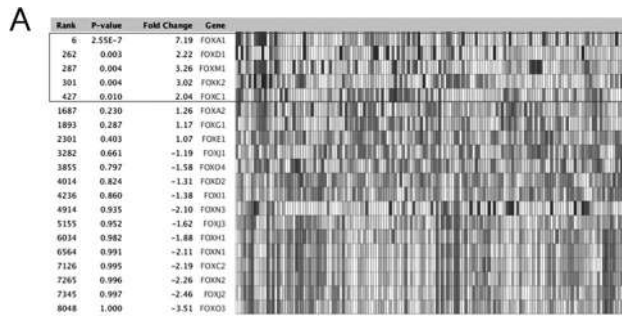
3. Results

3.1 FOXM1, FOXA1, FOXD1 and UBE2C Were Significantly Overexpressed In Lung Cancer

To examine the transcription level of all the members in FOX gene family in lung cancer, we performed concept analysis through ONCOMINE databases, which revealed that FOXA1, FOXD1, FOXM1, FOXK2 and FOXC1 were overexpressed in lung cancer in a database with 203 samples. FOXA1 transcripts were 7.19 fold elevated in lung adenocarcinoma comparing with normal lung tissue ($p=2.55e-7$). FOXD1 transcripts were 2.22 fold elevated in comparing with normal lung tissue ($p=0.003$). FOXM1, FOXK2 and FOXC1 were also distinctively overexpressed in lung cancer contrasting with normal lung in a database with 203 samples. (Figure 1A)

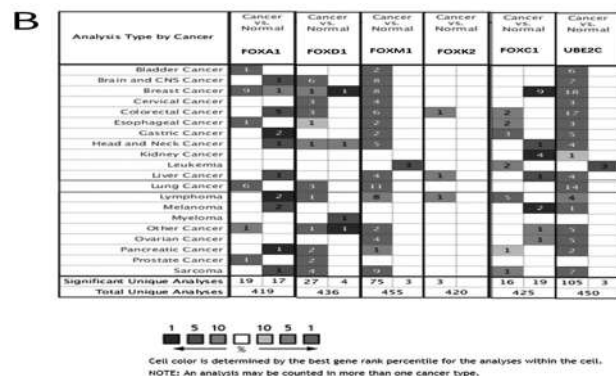
Additionally, the expressions of FOXA1, FOXD1, FOXM1, FOXK2, FOXC1 and UBE2C in a range of cancers were further explored through ONCOMINE analysis. It was found out that FOXM1 and UBE2C were significantly high expressed in a variety including brain and CNS cancer, breast cancer, colorectal cancer, sarcoma and especially lung cancer. FOXA1 and FOXD1 were comparatively high expressed in lung cancer. However,

FOXK2 and FOXC1 had no significant different expression in lung cancer. (Figure 1B)



1A: The transcription level of all the members in FOX gene family in lung cancer

Notes: The top highly expressed FOX family members in lung cancer in a research including 203 samples were showed in this figure.

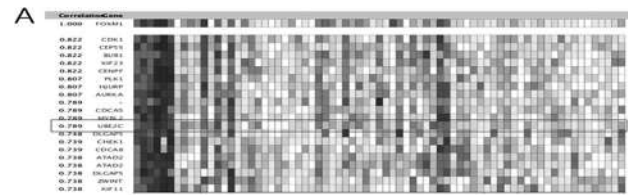


1B: The expression level of FOXA1, FOXD1, FOXK1, FOXK2 and FOXC1 in diverse cancers versus normal tissue

Notes: Overexpressed was in red, while low expressed was in blue. The number represents the number of studies meet the threshold in the ONCOMINE database.

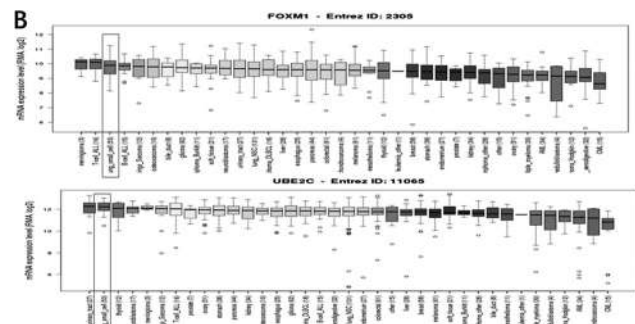
Figure 1. The overexpression of UBE2C was distinctly associated with FOXM1 expression

Since it was found out that FOXM1 was distinctively overexpressed in lung carcinoma and a variety of other cancers, we next carried out further exploration on the co-expression gene of FOXM1 through ONCOMINE database, which indicated that the expression of UBE2C was significantly related to FOXM1 ($r=0.789$). (Figure 2A) The result was demonstrated through CCLE analysis that FOXM1 and UBE2C were significantly high expressed in lung carcinoma cell comparing with other tumor cell lines. (Figure 2B)



2A: The co-expression analysis of FOXM1 and UBE2C

Notes: In ONCOMINE database, the co-expression genes of FOXM1 in lung cancer within a database including 73 samples were shown in this figure.

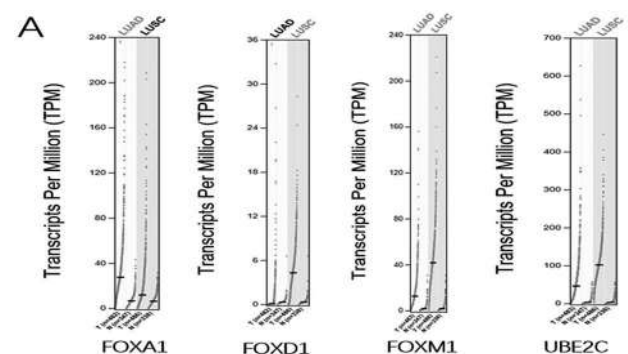


2B: The expression level of FOXM1 and UBE2C in a variety of cancer cell lines through CCLE analysis

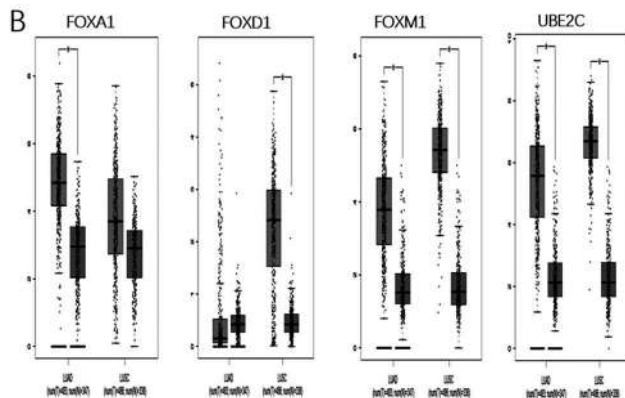
Notes: FOXM1 was the 3rd highest overexpressed in lung cell line behind meningioma and T-cell-ALL, while UBE2C was 2nd highest overexpressed in lung cancer cell behind urinary tract in different types of cancer cell lines.

Figure 2. The expression level of FOXA1, FOXD1, FOXK1 and UBE2C in lung adenocarcinoma and lung squamous carcinoma

We compared the expression level of FOXA1, FOXD1, FOXM1 and UBE2C in lung adenocarcinoma and lung squamous carcinoma through GEPIA dataset, which indicated that FOXA1 was overexpressed in lung adenocarcinoma (LUAD) instead of lung squamous carcinoma (LUSC), whereas FOXD1 was high expressed in squamous cell lung carcinoma (LUSC) tissues instead of LUAD. The expression level of FOXM1 and UBE2C were significantly high in both LUAD and LUSC. (Figure 3A, Figure 3B)



3A: The chromosomal distribution of over-red or under-green expressed genes was plotted through GEPIA analysis



3B: The expression of FOXA1, FOXD1, FOXM1 and UBE2C in LUAD and LUSC was plotted by Boxplot through GEPIA analysis

Figure 3. The expression level of FOXA1, FOXD1, FOXM1 and UBE2C in lung adenocarcinoma and lung squamous carcinoma

3.2 Correlations between FOXA1, FOXD1, FOXM1 and UBE2C Expression and Tumor Stage in Lung Cancer Patients

We also further analyzed the expression of FOXA1, FOXD1, FOXM1 and UBE2C with tumor stage for lung adenocarcinoma (LAC) and squamous cell lung carcinoma (LSCC). It was found out that FOXM1 and UBE2C were distinctively varied from different stages in all lung cancer. The later was the clinical stage, the higher were FOXM1 and UBE2C expression levels. However, FOXA1 and FOXD1 did not significantly differ ($P > 0.05$). (Figure 4)

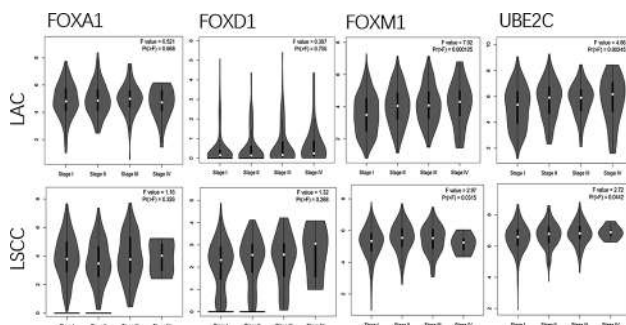


Figure 4. Association of FOXA1, FOXD1, FOXM1 and UBE2C expression with tumor stage in LC patients

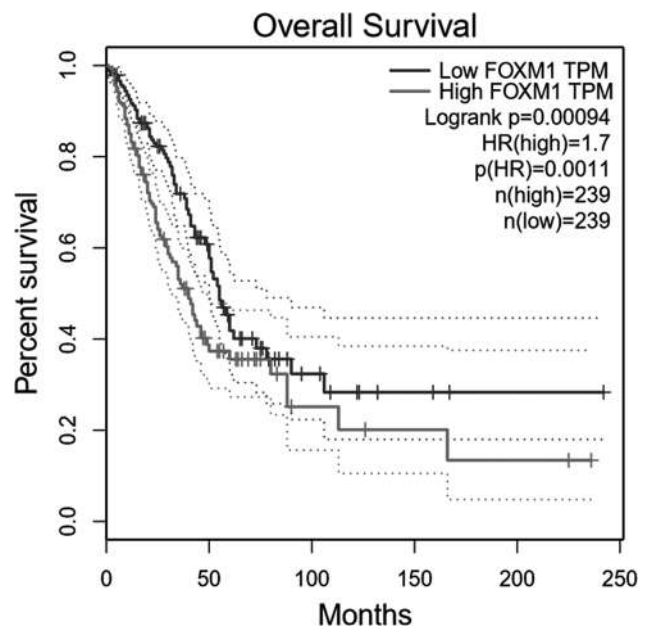
Notes: In GEPIA analysis, association of the target gene in lung adenocarcinoma (LAC) and squamous cell lung carcinoma (LSCC) stage was achieved.

3.3 The Prognostic Values of mRNA Levels of FOXA1, FOXD1, FOXM1 and UBE2C in NSCLC Patients

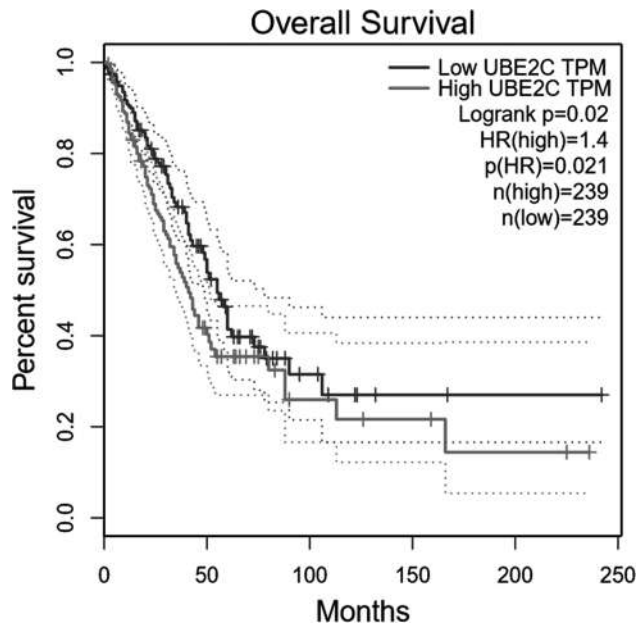
We further explored the prognosis of FOXA1, FOXD1, FOXM1 and UBE2C expression of patients with NSCLC. In Kaplan–Meier Plotter analysis, the correlations between the mRNA expression levels of the FOXA1, FOXD1, FOXM1 and UBE2C and the survival of patients with in LAC and LSCC was explored. Kaplan–Meier survival curve revealed that the expression levels of FOXA1 and FOXD1 were not associated with the overall survival (OS), progression-free survival (FP) and post-progression survival (PPS) in all NSCLC patients ($P > 0.05$).

The significance of FOXM1 in the prognosis of NSCLC was explored through Kaplan–Meier Plotter analysis. The results revealed that high expression level of FOXM1 was associated with shorter overall survival (OS) in NSCLC patients. It was founded that high expression level of FOXM1 was distinctly related to shorter overall survival (OS) ($HR=1.7$, $p=0.0011$) in NSCLC. (Figure 5A)

The prognostic value of UBE2C was explored through the Kaplan–Meier plotter. In figure 5B, UBE2C high mRNA expression was distinctly associated with shorter OS ($HR=1.4$, $p=0.021$) in NSCLC. (Figure 5 B)



5A: The prognostic values of mRNA expression level of FOXM1 in NSCLC patients



5B: The prognostic values of mRNA expression level of UBE2C in NSCLC patients

Figure 5

4. Discussion

Lung cancer, mainly developing from bronchogenic cell, is not only the highest prevalence, but also the cancer of supreme cancer-related mortality among all malignant tumor in the United States^[16]. Despite great progress in diagnostic and treatment technology has been made in recent years, the 5-year overall survival rate of lung carcinoma remains less than 15% primarily contributing to resistance to conventional therapies, as well as distant metastasis^[17, 18]. It is rewarding to illustrate the oncogenesis of lung cancer and develop new prognostic biomarkers.

It is reported that FOX gene family plays an important role on regulating the growth, differentiation, apoptosis, proliferation, migration, invasion and angiogenesis of tumor cells^[5]. ONCOMINE analysis revealed that, in the FOX gene family, FOXA1, FOXD1 and FOXM1 were significantly high expressed in NSCLC, implying their unique roles in NSCLC. The prognostic significance of FOXA1, FOXD1 and FOXM1 was further explored through Kaplan–Meier Plotter, revealing that FOXA1 and FOXD1 were not associated with prognosis in NSCLC, while FOXM1 was a vital prognostic biomarker for NSCLC patients especially for lung adenocarcinoma patients.

FOXA1 (Forkhead box A1) or HNF3 α (hepatocyte nuclear factor 3 α), is a major regulatory transcription factor regulating and controlling a range of tumors including breast, prostate and liver cancer.^[19,20] It was found that

FOXD1, up-regulated in different types of cancer including prostate cancer, ovarian cancer and breast cancer, was associated with cancer proliferation and resistance to chemotherapy.^[21-23] As a study reported that FOXD1 was overexpressed in NSCLC and associated with poor prognosis.^[24] However, in our current study, FOXA1 and FOXD1 were overexpressed in lung cancer. FOXA1 was especially high expressed in lung adenocarcinoma (LAC), while FOXD1 was in squamous cell lung carcinoma (LSCC). They didn't vary from lung cancer stage and were not associated with prognosis of NSCLC.

FOXM1, which is essential for multi-organ cell proliferation, differentiation and especially for cell apoptosis, was critical for the development and progression of a great deal of types of cancer.^[25] ONCOMINE analysis revealed that FOXM1 was overexpressed in lots of tumors including brain and CNS cancer, breast cancer, colorectal cancer, sarcoma and especially lung cancer. The results are in good agreement with the results of previous studies.^[24] In GEPIA analysis, FOXM1 was further demonstrated to overexpress in LAC and LSCC. Additionally, higher expression of FOXM1 was associated with later lung cancer stage. A study by Milewski et al. indicated overexpression of FOXM1 in LAC may associated with shorter OS or FP.^[26] Similar results were indicated by Kaplan-Meier plotter survival analysis in the present study that a high level of FOXM1 overexpression was related to shorter survival in LC patients, especially in patients with LAC.

FOXM1 was positively associated with the expression of UBE2C, demonstrated by ONCOMINE co-expression analysis. The results were consistent with a study by Nicolau-Neto Palumbo et al., revealing that FOXM1 and UBE2C are co-expressed in esophageal squamous cell carcinoma and other types of cancer.^[10,27]

UBE2C, as a transcription factor, plays an important role on the progression and prognosis of a variety of cancers including gastric carcinoma, rectal carcinoma and esophageal squamous cell carcinoma.^[28-30] However, the significance of UBE2C in the prognosis of LC patients remains deeply unknown. In the present study, ONCOMINE analysis revealed that UBE2C was highly expressed both in NSCLC patients and lung cancer cell lines. What is more, a high level of UBE2C expression was significantly associated with later LC stage and shorter survival in LAC. The results were consistent with a study by Zhang et al. demonstrated that overexpression of UBE2C in NSCLC was correlated with poor prognosis.^[31]

5. Conclusion

In summary, FOXA1, FOXD1 and FOXM1 were overexpressed in LC among FOX gene family. FOXM1 is pos-

itively associated with UBE2C, and they are distinctive biomarkers and predict shorter survival in LAC.

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ARTICLE

Application of Seamless Nursing Management in Emergency-ICU Patient Safety Transfer and Handover

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ABSTRACT

Objective: To analyze the application effect of seamless nursing management in the safe transfer and handover of emergency-ICU patients. **Methods:** A total of 160 patients admitted to the emergency department-ICU from November 2017 to July 2018 were randomly divided into the control group and the observation group, with 80 patients in each group. Among them, the patients in the control group underwent routine nursing management mode, and the patients in the observation group were treated with seamless nursing, comparing the transfer of the two groups of patients and the satisfaction score of the emergency-ICU nursing staff. **Results:** The transfer status of the observation group and the satisfaction score of the emergency-ICU nursing staff were significantly better than those of the control group. **Conclusion:** Seamless nursing management can improve the overall efficiency of transshipment.

1. Introduction

In the hospital, the ICU is a special department. During the emergency-ICU transfer process, factors such as information communication, equipment operation, and medical personnel handover often have adverse effects on the overall quality of transshipment handover, which can easily lead to nursing risk accidents.^[1] The application of seamless nursing management in emergency-ICU patient safety transfer and handover mainly analyzes the existing transshipment handover process, finds the problems in the process of transshipment handover, and adopts measures such as mechanism innovation and human resource opti-

mization to achieve seamless integration of various tasks. Based on this, the article was conducted in conjunction with 160 patients admitted to the emergency-ICU from November 2017 to July 2018, as detailed below.

2. Materials and Methods

2.1 General Information

A total of 160 patients admitted to the emergency-ICU from November 2017 to July 2018 were randomly divided into two groups, the observation group and the control group, with 80 patients in each group. Among them, the

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age of the observation group patients ranged from 22 to 71 years old, and the average age was (55.61 ± 6.97) years old; the control group was aged from 23 to 72 years, and the average age was (56.24 ± 5.86) years old. There was no significant difference in the general data between the two groups ($P > 0.05$), and there was some comparability.

2.2 Methods

2.2.1 Establish an Emergency-ICU Integrated Nursing Management Mode

The hospital rationally adjusted and optimized the nursing structure of the emergency department and ICU department, improved the management mode of emergency-ICU departmental nursing integration, and set up the head nurse of the emergency-ICU department to construct a comprehensive integrated nursing management structure.^[2]

2.2.2 Improve the Transfer Process

In the emergency-ICU patient transfer handover, the hospital should assess the risk before the patient is transferred, and arrange the emergency department nurse and the attending doctor to assess the rationality of the transfer. The assessment contents mainly include the patient's vital signs, respiratory conditions, medication status, and safety problems easily caused by the road; and arrange for transfer equipment, such as multi-function monitors, portable oxygen bags, etc. In the transfer process of critically ill patients, at least one doctor and one nurse ensure that the nurse's working life is more than five years, and he has strong sense of responsibility, judgment, and ability to deal with emergencies. In addition, in the transfer process, the medical staff should ensure the safety of the patient's position, keep the patient warm, protect the patient's privacy, ensure the patient's respiratory tract is smooth, and closely observe the patient's condition changes, and do emergency treatment.

2.2.3 Make Handover Contents Standard

The medical staff should design a transfer and handover order for critically ill patients according to the actual situation. The main contents include the patient's name, gender, age, and time of arrival in the emergency department, time of leaving the emergency department, type of disease, consciousness, pupil, vital signs, blood oxygen, blood sugar, medication, emergency treatment, emergency doctors and nurses, escort nurses, etc. Confirm the integrity of patient-related data, mainly medical records, wristbands, inspection reports, etc.^[3] At the same time, after the patient arrives in the ICU department, the emergency

department nurse should fill in the arrival time and fix the bed together with the ICU nurses. Move the patient to the hospital bed and connect and set the parameters such as oxygen, ventilator, monitor, etc. The nurses in the emergency department handed over the venous passages, pipes, skin, outpatient medical records, examination results, medications and other actual conditions to the ICU nurses to measure the vital signs of the patients. The emergency department nurses filled out the records and the signatures were confirmed by both parties. When filling out the record sheet, you should use carbonless copy paper in duplicate (the original is handed over to the emergency department and the copy is handed over to the ICU department for preservation).

2.2.4 Conduct Regular Training Activities for Nursing Staff in the Emergency Department and ICU

In order to realize the rational use of seamless nursing management in the emergency transfer-ICU patient transfer handover, the hospital conducts relevant training activities for the nursing staff of the emergency department and ICU department before the implementation of the seamless nursing management mode. Ensure that each nursing giver can understand and master the transfer-handling process of emergency-ICU patients, and use and fill out the transfer-transfer records of emergency-ICU patients.^[4] At the same time, in the process of carrying out training activities, the hospital should simulate the transfer of emergency-ICU patients. Ensure that each nursing giver clearly identifies all aspects of the transfer process, and formulates relevant cases to incorporate relevant content in the actual work, such as the patient's condition, medical order, emergency department and ICU department's rescue coordination, etc. Through the training activities, improve the comprehensive quality, nursing ability and emergency treatment capacity of medical staff, and ensure that the seamless nursing management work is effectively implemented.

2.3 Observation Indicators

First, compare the transfer and handover status of the two groups of emergency-ICU patients, mainly including the number of inter-unit electrical connections, the number of disputes between the two parties, and the number of missed handovers; second, compare the nursing work satisfaction scores of the two groups of emergency-ICU patients. Use the self-made nursing satisfaction survey to calculate the satisfaction of the nursing staff, including the transfer equipment, telephone inquiries, vital signs, valu-

ables, handover time and other indicators; the higher the satisfaction, the higher the score.

2.4 Statistical Analysis

In this research SPSS20.0 statistical software was used to process the data. Among them, the count data was represented by %, and the χ^2 test was used for comparison between groups. The measurement data were expressed by ($\bar{x} \pm s$), and the t-test was used for comparison between groups. The data were statistically significant at $P < 0.05$.

3. Results

3.1 Comparison of Transfer and Handover Status between Two Groups of Emergency-ICU Patients

Table 1. Comparison of transfer and handover between the two groups of emergency-ICU patients [$n(\%)$]

Group	Number of Groups	Telephone Contacts between the Departments	Number of Liability Cases between Both Transfer Sides	Missed Handovers of Patients
Control Group	80	11(13.75)	7(8.75)	4(5.00)
Observation Group	80	2(2.50)	1(1.25)	1(1.25)
χ^2 P	—	4.924 <0.05	4.236 <0.05	3.911 <0.05

As can be seen from Table 1, in the emergency-ICU patients in the observation group, the incidence of telephone contacts between the departments was 2.5% (2/80), the number of liability cases between both transfer sides is 1.25% (1/80), The incidence of missed handovers of patients was 1.25% (1/80); while in the control group, the incidence of telephone contacts between the departments was 13.75% (11/80), the number of liability cases between both transfer sides is 8.75% (7/80), The incidence of missed handovers of patients was 5.00% (4/80). The transfer and handover status of the observation group is significantly better than that of the control group. The incidence of telephone contacts between the departments, the number of liability cases between both transfer sides and the incidence of missed handovers of patients of the two groups were compared, and the data were statistically significant ($P < 0.05$).

3.2 Comparison of Nursing Work Satisfaction Scores between Two Groups of Emergency-ICU Patients

As can be seen from Table 2, the satisfaction scores of the nursing staff in the emergency-ICU patients in the observation group (95.04 ± 0.57) was significantly higher than that in the emergency-ICU patients in the control group (79.36 ± 0.31). The data of the two groups were statistically significant ($P < 0.05$).

4. Discussion

Seamless nursing management mode is a new type of nursing management concept, which is based on routine nursing, comprehensive and effective nursing management of quality gaps to improve the overall quality of nursing work.^[5] The effective application of seamless nursing management mode in emergency nursing work makes the relationship between emergency department and ICU department closer, and can timely feedback and solve the problems in the process of patient transfer and handover, and provide guarantee for the smooth development of nursing work to achieve standardized management of transshipment and handover content, effectively avoid the occurrence of unsafe accidents, and provide guarantee for the seamless handover of emergency department and ICU department.^[6] The research showed that 160 patients who were admitted to the emergency department and transferred to the ICU patient data were analyzed. In the process of transshipment and handover, a seamless nursing management model was implemented to record the transshipment status of the two groups of emergency-ICU patients and the satisfaction score of the nursing staff. The results showed that, the transfer and handover status, such as the incidence of telephone contacts between the departments, the number of liability cases between both transfer sides and the incidence of missed handovers of patients of the two groups, of the observation group is significantly better than that of the control group; the satisfaction scores of the nursing staff in the emergency-ICU patients in the observation group were significantly higher than those in the control group. The data of the two groups were statistically significant ($P < 0.05$). Therefore, the application

Table 2. Comparison of nursing work satisfaction scores between the two groups ($\bar{x} \pm s$)

Group	Number of Groups	Transfer Equipment	Telephone Enquiry	Vital Signs	Valuables	Handover Time	Satisfaction Scores
Control Group	80	3.12 ± 0.32	3.68 ± 0.34	4.05 ± 0.53	3.98 ± 0.32	2.96 ± 0.35	79.36 ± 0.31
Observation Group	80	4.69 ± 0.37	4.96 ± 0.43	4.89 ± 0.57	4.68 ± 0.39	4.82 ± 0.29	95.04 ± 0.57
P	—	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

of seamless nursing management in the emergency transfer-safety transfer of ICU patients has significant effects and is worthy of promotion.^[7]

5. Conclusion

In summary, with the development of society, China's medical conditions are constantly improving, and the nursing management model has improved. The use of seamless nursing management in the emergency transfer-safety transfer of ICU patients has effectively improved the overall quality of transshipment and delivery, and has gained more rescue time for patients.^[8] At the same time, the application of seamless nursing management mode effectively integrates high-quality nursing and holistic nursing mode, forming an integrated high-quality nursing model, which greatly improves the comprehensive quality and nursing ability of nursing staff.

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REVIEW

The Application of Theoretical Models in the Studies of Physical Activity Behaviors of the Elderly in China

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ABSTRACT

By using the method of literature review, this paper introduces the popular theoretical models which have shown to better explain physical activity behaviors at a certain degree, summarizes the dominating theoretical models in the studies of physical activity behaviors of the elderly in China. In addition, shortcomings and future prospects are pointed out at the end.

1. Introduction

At present, China is the country with the largest number of elderly population. By the end of 2017, there are 241 million elderly people aged 60 years and above,^[1] accounting for 17.3% of the total population. The trend of aging is still aggravating. It is estimated that the elderly population will reach 350 million by 2030.^[2] It is well known that physical function of the elderly declines, and the incidences of chronic diseases are greatly increasing. In addition, older adults are psychologically troubled by pessimism, loss and loneliness, and then the mental and psychological problems are popular. The task of healthy aging in China is very arduous. At the

same time, lack of physical activity, one of the four risk behavioral factors for many chronic diseases, has become a worldwide recognized public health and social problem, especially in developing countries. Less than 30% of the elderly in China exercise regularly. Under this serious situation, to actively improve the physical activity with a healthy lifestyle in older adults in China, cannot only enhance the physical fitness of the elderly and regulate their emotions, but also prevent and treat psychological diseases, in the end improving the quality of life and social adaptability. It has become one of the main strategies for China to achieve healthy aging.

In the 1940s and 1950s, the medical circles opened up the academic field of lifestyle risk factors of chronic

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diseases. As a health-related lifestyle, physical activity behaviors have entered the research fields of public health and preventive medicine scholars. To carry out the analysis of the characteristics of physical activity behaviors of the elderly, to explore the influencing mechanism of their behavioral patterns and to improve the intervention strategies and measures are not only the theoretical research needs of explaining the physical activity behaviors of the elderly, but also the practical needs of carrying out social intervention and promoting healthy aging. At present, in the research of physical activity behaviors of the elderly carried out by Chinese scholars, many foreign theories and models of physical activity behaviors are used for reference, and they are devoted to localization and cross-cultural research. Our study was based on major databases, including PubMed, EMBASE, Cochrane Library, Wan Fang, CNKI, and VIP, were searched for studies published in English or Chinese between January 2000 and December 2018. No other sources or search strategies were sought. A search of article titles and abstracts was conducted by the primary author. The keyword terms used in the search included “physical activity”, “exercise”, “running”, “walking”, “cycling”, “Tai Chi” or “Tai Ji”, “Qigong”, “brain”, “older adults”, “elderly”, “Chinese”, “Transtheoretical Model”, “Health Belief Model”, “Social Cognitive Theory”, “Theory of Planned Behavior”, “Locus of Control”, “Protective Motivation Theory”, “Social-ecological Model” and “Health Action Process Orientation Theory”. Review articles were also used as a source in a search or additional studies. So as to attempt to summarize and analyze the application status of different theoretical models in the study of physical activity behaviors of the elderly in China, as well as the shortcomings of the study and the future development direction.

2. The Academically Popular Theoretical Models of Physical Activity Behaviors

Academia began to pay attention to the study of mass physical activity behaviors in the 1940s and 1950s, and started to study the relationship between sports behaviors and physical health, which is mainly based on the theory of healthy behaviors. By the 1960s and 1970s, many scholars from the perspective of leisure, through a large sample survey, from the macro level to explore the status and role of physical exercise in leisure life. Since the 1970s and 1980s, scholars have turned their focus on the study of physical activity behaviors to the micro-level, applied the theoretical model of social behavior to the study of physical activity behaviors, and created theoretical models of physical activity behaviors with high explanatory value, such as Transtheoretical Model, Rational

Behavior Theory, Planned Behavior Theory, Social Cognitive Theory, etc. According to Yanping Duan, Brehm and Wagner’s research summary, the theoretical models of physical activity behaviors can be summarized into two categories: Continuous Theoretical Model and Stage Theoretical Model.^[3]

According to the above classification, Health Belief Model, Social Cognitive Theory, Rational Behavior Theory, Planned Behavior Theory, Control Point Theory and Protection Motivation Theory belong to the Continuous Theoretical Model, while Transtheoretical Model, Berlin Exercise Stage Theory and Health Action Process Theory belong to the Stage Theoretical Model. Continuum Theory regards the change of exercise behavior as a relatively static process. It assumes that a predictive model is suitable for all, and that the change of cognition and behavior seems to be a linear model. Although it can better explain the variance of intention, it cannot better explain the variance of behaviors. In the intervention of exercise behaviors, the use of unified content and measures cannot be based on the individual stage of exercise to adopt targeted intervention strategies. The Stage Theory Model considers exercise behaviors comprehensively from three aspects: cognition, behavior and time. It regards the change of exercise behaviors as a dynamic process of non-linear change, and takes into account the corresponding intervention strategies for the stage of individual health behavior change.^[4] The following will select several most representative models to describe, in order to explain the two categories in detail.

2.1 Health Belief Model

Health Belief Model (HBM) was first proposed by Rosenstock, an American psychologist, and revised by Becker and Maiman. It emphasizes the assessment of disease threat perception and behavior, namely, whether an individual takes healthy behavior depends on the individual’s perception of the seriousness of potential disease threat on the one hand, and the assessment of the necessary costs and benefits of action on the other.^[5] Although this theory explains to some extent the reasons why people participate in or do not participate in physical exercise, its application is different from the actual situation, and there are many disputes, such as the retrospective study, confusion in empirical research on perceived danger and perceived vulnerability. And when dealing with relatively serious health threats, the utility of health belief models has also been questioned.^[6] At the same time, due to the theoretical generality of HBM and the lack of clarity of the relationship between related concepts, the predictive power of HBM to exercise motivation and behavior is very low, which limits

its application in the field of exercise behaviors.^[7]

2.2 Transtheoretical Model

Transtheoretical Model of Behavior Change (TTM) was proposed by Prochaska, a professor of psychology at the University of Rhode Island, USA, and he compared and analyzed the essence theories of 18 psychotherapies and behavioral changes in 1979, and integrated the changing process and principles of different intervention theories. Finally, He proposed a complete method of behavioral change.^[8] And it has become the most widely used stage theory in the field of exercise behaviors. Its content structure is divided into four parts: change stage, change procedure, self-efficacy and decision-making balance. Among them, the change stage is the core organizational structure of the model, dividing the whole exercise process into five stages of cyclic change.^[9] The most attractive aspect of TTM is that it provides detailed and specific strategies for how to intervene at different stages. However, the distinction of TTM stages lacks the support of evidence, there are still ambiguities and ambiguities, and to a large extent, it is descriptive rather than explanatory. At the same time, TTM pays too much attention to the influence and function of psychological factors, but neglects the influence of environmental factors.

2.3 Social-ecological Model

Social-ecological Model (SEM) is also called Ecosystem Theory in sociology and social work. It is a theory used to study the interaction between human behavior and social environment. The theory regards the social environment in which human beings grow and live (such as family, institution, group, community, etc.) as a kind of social ecosystem, and emphasizes the importance of the ecological environment (human survival system) for the analysis and understanding of human behaviors. It is one of the important basic theories of social work to pay attention to the interaction of various systems between human beings and the environment and its significant impact on human behaviors.^[10] All-round multi-level intervention strategies are most effective for behavioral change, and the factors they play a role may be a direct one-to-one relationship or a one-to-many relationship.^[11] At present, Social-ecological Model has become one of the hotspots of foreign scholars.

3. Summary of the Common Theoretic Models in the Study of Physical Activity Behaviors of the Elderly in China

With the development of competitive sports, the theoret-

ical and practical research on the promotion of physical activity behaviors in China has risen. The research started in the early 1980s. Scholars adopt relevant theories and techniques of behavioral science, psychology, sociology, anthropology, communication and other disciplines, and combine the research thinking methods of inductive reasoning and deductive reasoning to carry out research around the characteristics of physical activity behaviors and influence mechanism.

In recent years, with the acceleration of the aging society and the implementation of the national fitness strategy, Chinese scholars have gradually paid attention to the elderly, but it is still in its infancy. In terms of mechanism theory, Chinese scholars draw lessons from foreign sports behaviors theories and models, devote themselves to localization and cross-cultural research, pay attention to the theoretical logic research at the macro level in the early stage, and gradually strengthen the micro-level research and empirical research. At the same time, with the help of relevant theories of behavioral science, organizational behavior, comparative behavior, psychology, anthropology, biology, culture, sociology, communication and economics, this kind of research combines deductive reasoning with inductive reasoning.

In the early stage of theoretical model study, Chinese scholars mainly interpreted the physical activity behavior of the elderly with the more direct and simple models, such as health belief theory, health action process orientation theory and Berlin exercise stage theory. For example, Duan Zhongyang tried to understand and describe the differences in the understanding of the health beliefs of the younger people in Wuhan through a sample survey of the younger people in Wuhan.^[12]

However, due to the insufficiency of explanatory power, scholars turned to Transtheoretical Model, Social Cognitive Theory, Planned Behavior Theory and Self-determination Theory, which emphasized individual psychological factors, to continue explaining and intervening behavior, and the Transtheoretical Model has become the most widely used stage theory in the field of exercise behavior.^[8] Kee-Lee Chou put forward the conclusion that self-efficacy significantly affects exercise behaviors by investigating the exercise behaviors of the elderly in Hong Kong and combining the viewpoint of Transtheoretical Model.^[13] According to the results of interviews, Xie Bin revised the scales involved in the Transtheoretical Model, used cluster random sampling method to measure the physical activity behaviors of the elderly in Xi'an, and summarized the main influencing factors of the physical activity behaviors of the elderly in different stages.^[14]

Nowadays, relying on the Social-ecological Model,

which is one of the hotspots of foreign scholars, Chinese scholars have further explained and intervened the exercise behaviors of the elderly. From the point of view of social ecology, Li Weiguang made a comprehensive analysis of Xiamen's sports for the aged by using "Ali's Principle", "Limiting Factor Law" and "Flower Pot Effect" in the model of social ecology, and explored the existing problems.^[15] Yi Xiangren used the method of qualitative and quantitative analysis to analyze data from three dimensions of individual, society, organization and environmental resources by using partial least square path modeling method, and constructed a Social-ecological Model of habitual physical activity of the elderly in China.^[16] Wang Ming took the elderly in Xuanwu District of Nanjing as the research object. By using the method of questionnaire and Arc GIS spatial technology analysis, he discussed the influence of built environment on the exercise behaviors of the elderly.^[17]

4. Research Deficiencies and Future Development of Directions

4.1 The Methodology of Model Research Lacks Advancement.

In the research design of model application, there are few case-control studies, cohort studies and intervention studies with high intensity of causality test. In order to improve the external validity of the study and to reveal its intrinsic law comprehensively and objectively, the means and methods of evaluation and analysis should be combined.

4.2 The Systematicness and Comprehensiveness of Model Research Are Not Strong

Whether it is the identification of influencing factors or the exploration of the relationship between influencing factors, there is still a lack of comprehensiveness and systematicness. Therefore, it is necessary to pay attention to the theoretical concepts of the models, consider the characteristics of the elderly and their behavioral effects, and investigate, analyze and explore the influencing factors of the elderly's physical activity behavior from the individual, community, society and other levels and angles, so as to truly reflect the behavioral law.

4.3 Localization Research on the Theoretical Models of Physical Behaviors of the Elderly Are Not Enough

There are great differences in social, economic and cultural development between China and Western countries,

especially in public service, community development, family concept, interpersonal communication and so on. However, the exercise behavior of the elderly is closely related to it. When drawing lessons from foreign theories and models, we should devote ourselves to the study of localization and cross-culture.

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REVIEW

The Progress of the General Prevention and Treatment of Pediatric Caries in China

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ABSTRACT

At present, caries has become one of the diseases that threaten peoples' health. Because caries usually does not affect patients' life safety, it is not paid enough attention to. In fact, the harm of caries to human health is significant. Caries can cause damage, defect or loss of teeth in the oral cavity. And it may seriously affect the quality of life and health of patients. Especially for children, they are in a critical period of growth and development. Caries may cause pain, lead to inflammation of alveolar bone and jawbone. The development of the dental system will be affected, and even lead to deformity. The prevalence of caries is high in children. Therefore, general prevention and treatment of caries is of great significance to the healthy growth of children.

1. Introduction

Caries is the most common disease in childhood, and also an important factor affecting children's health and growth. It has been listed as one of the chronic progressive diseases required more focuses on prevention and treatment worldwide by WHO. Caries is also known as the decayed teeth. And it's a bacterial disease. When suffering from caries, it is necessary to take timely measures to control it. If the control is not timely or not taken seriously, the continuous development of caries may lead to inflammation, which may affect the health and life of patients.^[1] As a susceptible population of caries, children are characterized by high prevalence and rapid development of caries. Clinical studies have confirmed that with the improvement of people's living stan-

dards and lifestyle changes, the incidence of dental caries is increasing, which is a risk factor that threatens children's health seriously. In this study, the characteristics and etiology of pediatric caries in China, and general prevention and treatment were analyzed comprehensively, so as to provide reference for the general prevention and treatment of pediatric caries in China.

2. The General Characteristics of Pediatric Caries in China

According to the clinical statistics, the prevalence of primary dental caries in children aged 5-year is 66.1%, and the filling ratio of caries is 3.4% in China. The prevalence of permanent teeth caries in children aged 12-year is 29.0%, and the filling ratio of caries is 11.2%. The data

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shows there are a large number of children with caries in China. At the same time, we can know that the prevalence of pediatric caries in rural areas is much higher than that in urban. Taking a city as an example, the prevalence of pediatric caries in rural area increased from 23.10% to 54.1% in 2008-2017, while the prevalence of pediatric caries in urban decreased from 25.5% to 12.22%. From the overall trend, with the advance of urban living standards and living conditions, as well as the improvement of people's health awareness, which directly decrease the prevalence of pediatric caries. Although rural living conditions have improved, health awareness is relatively deficient. As a result, the prevalence of caries is still relatively high.^[2]

3. Analysis of the Etiology and Related Factors of Caries

Caries is a chronic progressive bacterial disease, which often results in the progressive destruction of dental hard tissue caused by cariogenic bacteria under the influence of various factors. Caries develops from the superficial to the deep. Studies have shown that caries can develop shortly after tooth eruption, with infants as young as 6 months developing caries shortly after tooth eruption. Caries is much more harmful to children than adults.^[3] The occurrence of caries affects the basic functions of chewing and eating, and seriously affects the growth and development of children. The etiology and related influence factors are analyzed below. Details are as below:

3.1 Analysis of the Etiology of Caries

The major etiologic factors of caries are the four cascading factors -- bacteria, food, host and time. These are the main cause of caries, which many researchers agree consistently nowadays.

(1) Bacteria: A bacterium is the main factor of caries occurrence and continuous development. There are many types of bacteria causing caries, among which the most important bacteria are streptococcus mutans and lactobacillus. Among them, streptococcus mutans has strong cariogenic ability and is the dominant bacteria in the formation of dental plaque biofilm. It is one of the direct factors of caries, which can cause caries both in pit and fissure, and smooth surface. Streptococcus mutans and lactobacillus, the major pathogenic bacteria leading to caries, can gradually form dental plaque by mixing with food residues and salivary mucin in the oral cavity and firmly adhering to the tooth surface with the adhesin of bacteria. Dental plaque creates a certain microenvironment for bacterial metabolism. The bacteria can decalcify and dissolve

the enamel surface under dental plaque through acid production. Enamel caries is a continuous process of mineral salt loss, white spot surface demineralization lesion, and carious cavity formation. Studies have shown that the number of dental plaque in the oral cavity is positively correlated with the prevalence of pediatric caries.^[4]

(2) Food: in the process of caries formation, food is the important material basis for bacteria to play a role, among which carbohydrate is the main factor. If the food is high in sugar, it will provide energy for the bacteria in dental plaque to live and reproduce, and produce organic acids through metabolism. The long-term presence of these organic acids in the tooth surface and pit and fissure will lead to decalcification of tooth enamel. Among the several types of cariogenic carbohydrates, sucrose is the main cause of caries. In addition, we provide essential nutrients for tooth formation and development through food intake. In children with teeth developing, the intake of nutrients from food helps to develop the biochemical structure of tooth tissue. Teeth with good calcification have high caries resistance. If children do not have sufficient mineral salts and vitamins in their diet, their teeth will be less resistant to caries, which will create certain basic conditions for the occurrence of dental caries.

(3) The host's teeth, saliva, etc. The occurrence of dental caries is significantly related to the structure and morphology of the teeth. Deep pit and fissure of the occlusal surface and dental crowding are important defects that easily lead to retention of bacteria and food residues, which can be difficult to remove once occurs. Therefore, these substances are easy to lead to the occurrence of caries. Lack of mineralization, especially calcification of teeth, the dentin and enamel density decreased. Decrease ability to resist decay is another important factor leading to caries. Fluoride plays an important role in dental caries resistance, but its content in mineralized structure is low; in addition, saliva in the oral cavity also plays a role in the formation of dental caries. Saliva, which has the function of buffering and antibacterial, is the external environment of the tooth. When the amount of saliva on the tooth surface is large but thin, it can play a role in reducing the accumulation of bacteria and food residue. On the contrary, it is easy to lead to the retention of food, providing assistance for the formation and adhesion of bacteria on the tooth surface, inducing the occurrence of dental caries.

(4) Time: in addition to the above three factors, caries occurrence also needs a certain time of interaction. Long period of retention of food and bacteria in the oral cavity can significantly shorten the time of caries and accelerate the formation of caries.

3.2 Related Factors Causing the Occurrence Caries

Other main factors that lead to caries are social and family factors, children's dietary habits, etc. Social and family factors refer to the financial conditions, level of education, acceptance level of caries related knowledge, etc. Generally, financial condition is an important objective factor of pediatric caries. However, people's level of education and knowledge of caries are the key factors. Children's dietary habits are also an important factor leading to the increase incidence of dental caries. Studies have shown that the incidence of caries in children with a sweet tooth habit is 35.50% higher than that in children who do not like sweet food. This is because the sugar in sweet foods plays a leading role in the etiology of caries.^[5] In addition, regional factors are also an objective factor of caries. For example, the soil and water in some areas contain carious or anti-caries components; and the fluorine content exceeds normal standard in some regions. The proper amount of fluoride can enhance the anti-caries ability of the teeth. It can enter the body through drinking water and food, which can reduce the incidence of caries.

The incidence of dental caries is also affected by poor lifestyle, poor or biased prevention awareness of caries, lack of caries prevention knowledge, etc. Firstly, poor lifestyle, such as children do not develop good oral hygiene habits, poor oral environment, which will lead to the breeding of bacteria, is an important factor of inducing caries; in addition, some children have bad dietary habits, including picky diet, monophagia, which results in the unreasonable dietary structure and nutritional intake. And then, these habits lead to a higher prevalence of dental caries. Secondly, children or parents do not have a profound awareness or have a weak awareness of caries prevention. They may think that a bad tooth is nothing and fail to take timely preventive measures in daily life. There are also some parents have the deviation of the preventive understanding of caries, especially to the primary teeth. Parents think that children will have teeth replaced. And it doesn't matter to have caries now. Therefore, insufficient attention has been paid to the prevention of caries, which may lead to the occurrence or deterioration of pediatric caries. Thirdly, most parents are lack the knowledge of caries prevention. Although some parents may be aware of the dangers of caries, the prevention methods are not correct. For example, incorrect brushing methods, choice of toothpaste and toothbrush will eventually lead to unclean teeth, food residue on the teeth. The prevention of caries did not achieve the ultimate ideal effect.

4. The General Prevention and Treatment Measures of Pediatric Caries

4.1. The General Prevention and Treatment Technologies of Pediatric Caries

4.1.1 Pit and Fissure Sealing Technology

This technology has formed a series of mature technologies through years of development. For example, ultrasonic cleaning pit and fissure sealing technology, sand blasting pit and fissure sealing technology, laser irradiation pit and fissure sealing technology. Based on evidence-based medicine, some scholars have proved that the caries prevention effect of pit and fissure sealing technology is effective, which can effectively reduce the incidence of caries. At present, this technology is the most commonly used and the most effective general prevention and treatment of pediatric caries.^[6]

4.1.2 Fluoride Caries Prevention Technology

A certain amount of fluoride can inhibit cariogenic bacteria and enhance the anti-caries ability of the teeth. Some scholars have proved through research that the combined application of this technology and pit and fissure sealing technology can achieve a better effect of preventing dental caries. At the same time, the use of fluoride toothpaste in daily life can also effectively reduce the incidence of dental caries.

4.1.3 Preventive Resin Filling Technology

With the continuous application and development of dental materials, this technology realizes the development of filling materials from composite resin to flowable resin, and the flowable resin filling materials have a higher preservation rate. Its application together with pit and fissure sealing technology can also effectively reduce the prevalence of pediatric caries.

4.1.4 Non-traumatic Restorative Treatment Technology

The technology has the advantages of simple operation and the like in the specific use, its anti-caries effect is also very good, and it is easily accepted by users. Because of its unique application advantages, it has been widely promoted and applied in clinical practice, and has a high success rate in comprehensive prevention and treatment of pediatric caries.

4.2 Comprehensive Prevention Measures for Pediatric Caries

4.2.1 Daily Oral Cleansing and Maintenance

In the first place, the correct and scientific tooth brushing method can remove the dental plaque adhered to the surface of teeth in a timely and deep manner, and the essentials of correct brushing are as follows: firstly, choose a better quality toothbrush and fluoride toothpaste suitable for children; secondly, the amount of toothpaste for each tooth brushing can be the size of a soybean; thirdly, brush teeth every morning and evening, each time for more than 3 minutes. In the next place, good eating habits are also very important for the prevention of pediatric caries. For example, children should try to eat less sweet or not eat, eat fewer snacks, especially to change the bad habit of eating before going to bed. At the same time, parents should do a good job of monitoring infant oral hygiene, and pay attention to the growth and development of infant teeth; for parents with a history of dental caries, prevention and maintenance should be strengthened to avoid cross-infection of bacteria through saliva, and early detection and treatment of pediatric caries should be achieved.^[7]

4.2.2 Supplementation of Various Nutrients

To prevent pediatric caries, children should also be supplemented with nutrients such as trace elements and vitamins that affect their teeth growth. Children whose teeth are in the growth and development stage should be timely and reasonably supplemented with vitamins or trace elements such as calcium, iron and vitamin D to promote the good growth of teeth, prevent the conditions such as dentin hypocalcification and dentin damage, so that children's teeth can enjoy a certain hardness and toughness and enhance.

4.2.3 Preventive Measures for Dental Caries Susceptibility Period

Generally, when children are 1-3 years old, their deciduous teeth have all erupted, which is the dental caries susceptibility period. Therefore, the prevention of dental caries should be done well in this period. For example, attention should be paid to the rational collocation of children's food and make supplementary food at home to avoid excessive intake of food additives, ensure that a balanced diet can promote the healthy growth of children, while ensuring the normal development of their teeth and enhance the tooth's ability to resist the dental caries.

4.2.4 Carry out Oral Health Publicity and Education

Every year, September 20 is the "Teeth-Care Day", which is set to enhance people's awareness of the importance of dental health, thereby improving the oral health level of Chinese people, and enhancing people's awareness of prevention and treatment of the pediatric caries. At the same time, in people's daily dental care, the importance of dental care can be publicized for people by means of text and video.

5. Conclusion

The prevalence of pediatric caries has a certain relationship with the impact of different periods. If there is malnutrition during the mother's pregnancy, it will affect the growth and development of the fetus in the maternal body, at the same time, it will also lead to the occurrence of fetal dental enamel hypoplasia, which will lead to dental caries caused by acid corrosion. Therefore, during pregnancy, women should pay attention to proper supplementation of various nutrients required by their bodies and the growth of the fetus, such as protein, various vitamins, calcium, iron and other trace elements. A balanced diet can prevent dental caries.^[8] The infants is in breast-feeding should be mainly fed with breast milk, because breast milk contains various nutrients needed by infants, and is easy to digest and absorb. If they are fed with milk or powdered milk, sugar should not be added in the preparation and avoid developing the habit of falling asleep with a pacifier to avoid dental caries that may develop soon after tooth eruption, and it's called "milk bottle caries"; if the baby has such bad habits, parents should pay attention to timely correction or ingesting a certain amount of warm boiled water after feeding, which plays a certain role in oral cleaning. After the baby is born for 6 months, complementary foods, such as vegetable porridge, egg yolk, can be provided, but attention should be paid to not adding sugar in the supplementary foods, so as to avoid creating conditions for the occurrence of dental caries.

Preschool age is a critical period for the growth and development of children's permanent teeth. Therefore, at this time, the amount of sugar in food intake should be controlled and the frequency of snacks eaten between meals should be reduced, which is an important link in the prevention of dental caries. Generally, 6-year-old children have the highest incidence of dental caries. Therefore, parents should pay attention to the development of children's good eating habits at this time. Parents should first have a certain understanding of nutrition knowledge, and focus on correcting bad ways and habits and oral hygiene

to achieve the goal of comprehensive prevention and treatment of pediatric caries.

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