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Research Progress on the Pain Management Model of Children's Tumor Patients

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Abstract: ***According to the latest data released by the National Cancer Research Institute of the World Health Organization, the number of new cancers and deaths in China ranked first in the world in 2020, so cancer treatment has become the focus of attention in the field of health care [1]. There are important challenges in the treatment of pain management and soothing treatment of tumor patients. In order to improve the quality of life of cancer patients, there is an urgent need to solve relevant medical problems in China [2]. Therefore, in the process of anti-tumor treatment, it is very important for pain assessment and pain management of children. It can be seen from the literature that the pain management of childhood tumor patients has not been perfect [3]. Timely, standardized, effective and long-term pain management and control is crucial. This article aims to make a brief review of the current situation of children's tumor pain management, pain assessment tools, and the research progress of children's tumor patient management model.***

Keywords: Childhood tumor patients, Pain assessment tool, Pain management model, Review**.**

1. Current Status of Pain Management Mode of Children's Tumor Patients

1.1 The Current Situation of Pain in Child Tumor Patients

With the continuous progress of treatment technology and the improvement of treatment methods, the 5-year survival rate of cancer patients has increased in the past. Some studies have pointed out that the 5-year survival rate of children with leukemia is 88%, while the 5-year survival rate of children with other types of cancer is 92% [4]. Although the survival rate of childhood cancer is gradually increasing, the pain caused by the disease seriously affects the quality of life of their families. The treatment of cancer pain is facing serious challenges. About a quarter of new cancer patients have different degrees of pain. The incidence rate of pain during treatment is as high as 55%. After treatment, the proportion drops to 40%. The probability of late or diffuse pain is close to two-thirds, that is, about 66%, while moderate to severe pain accounts for about 38% [5]. In clinical practice, failure to manage and control cancer pain in a timely, standardized, effective and lasting manner may aggravate the disease and cause or aggravate patients' problems such as tension, depression, panic, anxiety and sleep disorders, thus deeply interfering with their daily work and rest, social interaction, self-care and overall quality of life [6]. Sickness may also have a negative impact on the body's resistance, thus fueling the spread of tumors and adding a heavy psychological burden to patients and their families. Therefore, scientific analgesics must be adopted to help children with tumors and their families improve their quality of life.

1.2 Current Model of Tumor Pain Management

At present, the mode of pain management of children's tumors is mainly analgesic, which is of great significance in cancer treatment, and the main task is to relieve the pain of patients [7]. For patients with cancer pain, it is necessary to implement regular examinations, standardized pain assessment and effective pain suppression measures, focusing on overall and continuous care management, and relevant guidance and support should be given to patients and their relatives. Although effective ways can be used to relieve children's pain, the pain of this special group has been ignored, depriving them of access to comprehensive treatment. On the one hand, parents have a poor understanding of analgesic drugs, and 54% are worried that using analgesic drugs will become addictive and cover up the disease. When pain occurs, the child is generally encouraged to be strong or distracted. On the other hand, children face unique obstacles in proper pain management, such as hesitantly report pain when they think that their voices will be ignored or will not be taken seriously. In addition, if children are afraid of limited social activities, they may not be able to accurately report pain. Generally speaking, insufficient attention has been paid to pain relief treatment in children with cancer patients. Assessing the insufficient level of pain and parents' lack of knowledge about pain are the main obstacles to pain management. In 1995, the Pain Society listed pain as one of the basic life indicators of the human body, and China launched the "Model Ward for Standardized Treatment of Cancer Pain" program in April 2011, which contributed to improving the concept of cancer pain treatment [8]. In recent years, there has been a change in children's awareness of pain, and there is now a public consensus that pain alleviation is essential. Since the 1970s, studies comparing pain management in children and adults have shown multiple reactions to pain, thus promoting the need for deeper attention to pediatric pain. The management of childhood cancer pain is a difficult process due to the way children perceive pain, their dependence on their parents, the complexity of evaluation, and the limited supply of safe analgesics. The whole pain control plan has not been widely used in a precise, specialized and systematic way, including the study of pain-related influencing factors, the use of pain assessment tools and the application of personalized analgesic drugs.

2. Progress of Pain Assessment of Child Tumor Patients

Compared with adults, children are often unable to accurately express pain, which makes medical staff and parents not pay enough attention to the pain of children with cancer, which

makes the pain treatment of these small patients easy to be ignored. Domestic medical teams have insufficient understanding and attention to the problem of dealing with cancer pain. Some studies have shown that doctors' understanding of cancer pain is not comprehensive enough, and there is also a lack of cancer pain treatment, especially in grassroots hospitals. In terms of cancer pain treatment, the Guidelines for the Treatment of Adult Cancer Pain issued by NCCN elaborate on the specific requirements for standard treatment, emphasizing the importance of accurate and detailed pain assessment before adopting a standard treatment strategy for cancer pain. In China, the evaluation of cancer pain mostly depends on the patient's own description. Considering the obvious differences between children's individual individuals, there are differences in their pain experience and expression ability, which leads to challenges for medical staff in judging the pain of children with cancer patients. When dealing with childhood cancer patients, medical personnel pay more attention to the treatment of cancer and its possible complications. There is relatively little attention to pain problems, so there is a problem of accuracy in pain assessment. Medical staff need to fully understand cancer pain and be proficient in pain assessment, so as to accurately evaluate the pain caused by tumors. Through a survey of medical workers' mastery of pain knowledge, the results show that at least 80% of the correct understanding is recognized as qualified. In contrast, the correct understanding rate of pain-related knowledge by medical personnel in Western developed countries is roughly between 63% and 74%, while the accuracy rate of practitioners in this regard is only 32% to 43%, which shows a significant lack of pain management knowledge. The pain learning and professional training efforts of medical professionals and nursing staff need to be continuously strengthened to improve medical staff's understanding of the basic knowledge of pain, so as to conduct pain assessment more quickly and comprehensively in practice. Due to the continuous changes in the situation of children, it is of great significance for the dynamic cancer pain assessment to optimize the individualized medication of children.

3. Pain Assessment Tool

3.1 Basic Information Questionnaire

The questionnaire includes: basic information (name, gender, age, height, weight, occupation, home address, medical insurance, family income, education level, religious belief, etc.). Disease situation (name of the disease, disease grade, time of diagnosis, course of disease, recurrence). Treatment (whether treatment, treatment plan, whether it is relieved). Pain (long-term repeated pain experience, whether the pain is periodic or continuous, whether there has been educated explanation of pain management, etc.).

3.2 Pain Assessment Scale

The digital scoring scale (NRS) adopts the NRS 0-10 version, where 0 means no pain, mild pain can be defined from level 1 to level 3, while moderate pain is described by level 4 to level 6, and the degree of extreme pain is described by level 7 to level 10. The classification of NRS is relatively intuitive and accurate, which helps patients accurately assess the degree of pain and promotes the comparability of evaluation results between different patients. The understanding of NRS requires patients to have the ability to understand abstract scales and words, so it is more suitable for children over 12 years of age. Wong-Baker is a facial expression pain grading tool consisting of six different facial expressions, ranging from smiling or happy to crying. The nursing staff evaluates the degree of pain according to the changes in the patient's facial texture, and use the "Face Expression Pain Score Scale" as a tool to compare. Therefore, there is an expression that is painless (first face), followed by mild pain (second face), then moderate pain (third and fourth face), and finally severe pain (fifth and sixth face). It is suitable for individuals who need additional understanding and communication, such as young people, the elderly, patients with language barriers or cultural differences. Recommended for people who are≥3 years old. Flacc Scale: The design goal of the assessment system is to quantitatively assess the intensity of pain perceived by children from two months to three years old. It contains five evaluation dimensions: facial expression, body movement, usual behavior, crying, and response when receiving appeasement. People can get up to 2 points per dimension and a cumulative score of 10 points. The pain rating is determined based on the total score: 0 means no pain. 1 to 3 points are classified as mild pain. 4 to 6 means that the pain is moderate, and 7 to the maximum score of 10 means that the child is experiencing high-intensity pain.

3.3 Comprehensive Pain Assessment

Involving the cause and category of pain (body, organ or caused by neuropathy), pain attack status (specific location, description, intensity, deterioration or related factors), pain treatment, functional state of key organs, mental appearance, family and social support status, including patient's medical history information (such as history of mental illness, history of drug abuse), etc., so as to make a preliminary evaluation of the pain suffered by child patients.

3.4 Quality of Life Table (EORTC QLQ-C30)

"European Cancer Research and Treatment Organization Quality of Life Questionnaire-C30 Chinese Version" consists of 30 projects, covering fifteen aspects, including five functional dimensions, namely, physical, social role, emotional, social and cognitive skills. There are also three dimensions about symptoms, that is, fatigue, pain and nausea, plus a dimension about the overall health status, and six independent items, involving poor breathing, food loss, sleep disorders, constipation, diarrhea and economic conditions. In the evaluation, the score of the functional dimension and overall health status is more and more superior, indicating that the functional state and quality of life of the evaluated person are relatively high. The higher score in the symptom dimension and six independent items indicates the severity of the relevant problems. The comprehensive score of EORTC QLQ-C30 is calculated by adding the 13-dimensional scores of the scale and taking the average value, excluding the financial situation and overall health status. Before calculating the comprehensive score, the symptom dimension and the score value of 6 individual indicators must be converted accordingly (original score minus 100 points).

3.5 Pittsburgh Sleep Quality Index (PSQI)

The sleep quality of the subjects can be evaluated in the last month. It contains 19 self-assessment and 5 other people's evaluation contents, of which the 19th self-evaluation and 5 other people's evaluation content are not included in the score. Only 18 self-assessment content related to the score are introduced here. The seven components contain 18 items, each of which is divided into 0-3 levels. The cumulative score of each component is: "The overall score of PSQI is between 0 and 21 points, and the increase in the score represents the gradual deterioration of sleep quality. The survey of participants takes about 5 to 10 minutes.

3.6 Anxiety Self-Assessment Measure (SAS)

Contains 20 items to measure the intrinsic experience of individual anxiety. Through this scale, the intensity of anxiety and its changes can be judged. SAS scores with four gradients, which mainly evaluates the frequency of symptoms. The evaluation is based on: almost or few, occasionally, often, almost always or completely. The Self-Assessment Depression Scale (SDS) consists of 20 items used to assess individual depression.

3.7 Self-Rating Depression Scale (SDS)

SDS contains 20 projects to explore the personal experience of depression. The severity of depression and its changes are immeasurable. The score of SDS adopts a level 4 system, which mainly evaluates the frequency of symptoms, divided into '1' almost or very little, '2' occasionally, '3' most of the time, and '4' most of the time.

3.8 General Self-Efficacy Scale (GSES)

Following the Bandura concept, the individual's self-esteem is closely related to emotions, cognitive patterns and specific behaviors. Emotionally, self-efficacy is usually associated with depression, tension and helplessness. In terms of cognition, self-efficacy can promote an individual's thinking process and performance level in various situations, including decision-making accuracy and academic achievement. Self-expression can enhance or reduce the level of personal motivation. Individuals with high self-efficacy usually challenge themselves, set higher goals, and unswervingly strive to achieve them. When starting the action, those with a strong sense of self-efficacy tend to be more diligent and able to maintain a long-term sustainability. Even in the face of adversity, they can quickly overcome and regain their fighting spirit. GSES contains a total of 10 contents to examine the individual's level of confidence in the face of difficulties or challenges. The design of GSES adopts a four-level scale, and each project needs to be rated 1-4. Each subject answers each question according to his or her personal situation and chooses "completely incorrect", "somewhat correct", "mostly correct" or "completely correct". In the scoring process, "totally wrong" get 1 point, "slightly accurate" get 2 points, "mostly correct" get 3 points, and "100% correct" get 4 points.

4. Advances in Pain Management in Children with Tumors

In the face of cancer patients, daily examination, standard evaluation and effective pain control must be carried out, emphasizing all-round and full-process management, and attention should be paid to the education of patients and their families. In 1995, the American Pain Society declared that pain is a basic physiological indicator of the human body, juxtaposed with heart rate, blood pressure, body temperature and breathing frequency. In April 2011, China launched the "Model Ward for Standardized Treatment of Cancer Pain" plan, which further improved the treatment concept of cancer pain. As time goes by, people's understanding of the suffering of children has changed, and it is generally believed that it is essential to alleviate this pain. Since the 1970s, studies comparing pain management in children and adults have shown multiple responses to pain, thus promoting the need for deeper attention to child pain. The management of childhood cancer pain is a difficult process due to the way children perceive pain, their reliance on their parents, the complexity of evaluation, and the limited supply of safe analgesics. Through the study of pain-related influencing factors, the use of evaluation tools to achieve personalized analgesic drug treatment, and explore the whole process of pain control solutions have adopted a meticulous, highly professional and strict scientific methodology.

At present, in drug treatment practice, following the double-drug model developed by WHO, in the face of the suffering of children with cancer, non-steroidal anti-inflammatory drugs, such as paracetamol or ibuprofen, may be used for mild pain. When the pain enters a more severe stage, it is recommended to choose more effective opioids in cases of moderate to severe pain. It is relatively safe to apply drugs such as morphine to children with cancer. So far, there have been no reports pointing out that their use will lead to addiction or accelerate the death of patients. For specific guidance on the use of drugs and the management of adverse reactions, you can refer to relevant academic treatises [9]. In addition to pain, other frequent symptoms should also be treated in time, such as loss of appetite, bleeding of skin and mucous membranes, oral sores, difficulty swallowing, nausea, dyspnea, convulsions, and imbalance between body fluids and electrolytes. These symptoms can generally be treated according to the clinical routine treatment plan.

5. Summary and Outlook

In summary, the care requirements for children with tumors will increase day by day. Although there are still many hospitals that have not set up children's cancer treatment departments, and there are few medical personnel specializing in the management of such patients, and there are still many obstacles to effectively promote the treatment of cancer pain in small patients in clinical practice and scientific research activities [10], but the concept and action measures of child tumor patient management have been long development. It is suggested that all doctors, nurses and other medical workers engaged in children's blood and cancer-related fields should actively integrate into the children's tumor diagnosis and treatment system, which may be the future development direction, and the management of children with tumors may also become an important comprehensive treatment method, in addition to chemotherapy, surgery and radiotherapy. At present, Chinese pediatricians usually lack professional

training and adequate attention when dealing with the pain problems of child tumor patients. Parents of children usually pay more attention to clinical treatment, such as surgery, radiotherapy, chemotherapy, etc., but do not pay much attention to pain management. Therefore, the duration of anti-cancer treatment is delayed. Therefore, it is urgent for pediatricians, nurses and other relevant medical staff to pay more attention to the pain management of children with tumors.

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