

Nursing of Children with Incomplete Kawasaki Disease

ABSTRACT

Objective: To explore how to care for incomplete Kawasaki disease (IKD).

Methods: To study the nursing of IKD caused by coronary artery disease by referring to relevant literature.

Through the analysis of the existing domestic and foreign literature, it is found that correct and timely nursing plays a vital role in the treatment of IKD.

Results: Clinical practice showed that timely and effective nursing measures are the important means to treat IKD. Eye care, skin care, and fever care can reduce the pain caused by this disease.

Conclusion: Correct, effective and timely nursing measures play an important role in the treatment of IKD.

KEY WORDS: Incomplete Kawasaki disease; Coronary artery disease; Nursing; Children

INTRODUCTION

In recent years, the prevalence of incomplete Kawasaki disease (IKD) is increasing year by year[4]. KD is the most common cause of acquired cardiac disease in children in developed countries[4]. We aim to study which timely and effective nursing measures can alleviate the suffering of children with IKD, and summarize important nursing measures by reviewing relevant literature in relevant databases. At present, the research on IKD is limited[4], so how to care for children with IKD is of great significance for our research. In this study, the symptoms of IKD were targeted from multiple dimensions to reduce the discomfort of patients during the treatment of KD. Providers in acute care settings need to have a high degree of suspicion for KD so that those affected may receive appropriate and timely treatment[4]. The Japanese Circulation Society guidelines define coronary aneurysms by either a Z-score or diameter. Giant coronary aneurysms are a Z-score ≥ 10 or diameter ≥ 8 mm; medium aneurysms are a Z-score between 5 and 10 or diameter between 4 and 8 mm; and small aneurysms are a Z-score between 2.5 and 5 or diameter between 3 and 4 mm[4].

1, CLINICAL MANIFESTATIONS

Main manifestations of Chinese guideline as follows: If the fever persists for 5 days or more, or the fever duration is less than 5 days, and there are 2 or 3 of the 5 main clinical features, and there are clear echocardiographic changes in coronary artery lesion (CAL), namely (1) left or right coronary artery Z-value ≥ 2.0 or (2) coronary artery characteristics that meet the CAL related criteria (inner diameter > 3 mm in < 5 years old, inner diameter > 4 mm in ≥ 5 years old, and/or adjacent inner diameter dilation ≥ 1.5 times or obvious irregularity in the lumen), the diagnosis is IKD[4].

2, NURSING OF IKD

(1) Nursing evaluation

The initial assessment of a child with IKD involves evaluating various factors, including the child's overall condition (e.g., age, weight, nutritional status), the extent of the disease (e.g., presence of fever, skin mucosal lesions), and the presence of any additional complications.

(2) Eye care

Bilateral conjunctivitis typically manifests as non-suppurative and painless inflammation of the conjunctiva, frequently affecting both eyes. It is recommended to cleanse the child's ocular secretions daily, avoiding the use of rough towels and instead employing sterile cotton swabs or gauze to gently wipe the affected area. In cases of conjunctival redness, it is advisable to maintain ocular hygiene, refrain from manual eye rubbing, avoid excessive ocular strain during the initial stages of the condition, advise parents to restrict children's screen time on electronic

devices, and advocate for protective measures such as wearing sunglasses outdoors to minimize exposure to sunlight. Additionally, eye drops may be utilized under the guidance of a healthcare professional to alleviate symptoms of dryness and discomfort.

(3) Oral care

The presence of diffuse mucosal inflammation in the mouth and lips is characterized by redness, swelling, and cracking of the oral mucosa, as well as a red, swollen, and cracked appearance of the tongue and lips resembling a strawberry. It is imperative to engage in communication with the families of affected children, enhance their awareness of oral health, maintain cleanliness of the oral mucosa, utilize a soft-bristled toothbrush if the mucosa is intact, and avoid consuming overly hot or irritating foods in their daily diet. If mouth has ulcers, don't use toothbrush, gargle frequently with lukewarm water. Have liquid or semi solid diet. Take care that food should not be too hot. You can test the temperature on the inside of the wrist, appropriate after eating. Dry lips, rub paraffin oil to protect and moisturize, do not forcibly tear off the dead skin to avoid bleeding.

(4) Skin care

In children with IKD, manifestations such as urticaria, rash, papule, erythema pleomorpha, and occasionally micropustular rash on the extremities and trunk may occur. Proper skin care, particularly of the fingers and toes, is essential to maintain cleanliness, dryness, and skin integrity. Regular monitoring of fingernail length is advised to prevent infections resulting from scratching. Clothing made of cotton in a loose fit is recommended to minimize skin friction. When the skin itch is unbearable, it can be relieved by distraction. When the joints of fingers and toes are red and swollen, a hot compress can be used to reduce the pain. Patients should rest in bed as much as possible and have a support if they need to move their limbs. The highest immunization rates are in Japan due to endemic tuberculosis, where reactions at the BCG site have been recognized as a significant and common finding in KD patients[8]. Diffuse and extensive maculopapular erythematous rash, extensive erythroderma, or erythema multiforme-like, appears in the first few days of the disease and is often transient[9].

(5) Fever care

The disease begins abruptly with high fever, and the first day of fever is considered the first day of the disease. The fever is remittent and lasts 1–3 weeks[9]. Children with IKD must exhibit fever for a minimum of five days prior to receiving a diagnosis. Throughout this diagnostic waiting period, family members may experience heightened levels of anxiety. In order to alleviate this anxiety, psychological support will be provided to both family members and affected children, along with explanations of disease-related information to help alleviate tension. Additionally, close monitoring of the child's temperature fluctuations will be conducted, with hourly temperature measurements and analysis of fever patterns. The environmental conditions, including a temperature range of 22 to 24 degrees Celsius and humidity levels of 55% to 56%, will also be closely monitored during this fever period. If antipyretic medication is administered, it is recommended to reevaluate the patient's temperature after a period of thirty minutes. In cases of fever and chills, it is advised to provide warm water for consumption and apply warm compresses to the extremities. Additionally, for individuals experiencing warmth in their extremities, the application of an ice pack to the head or warm water to the neck, armpit, and groin area may be beneficial. It is important to note that children with fever, particularly those exhibiting crying behavior, may experience increased oxygen consumption, especially in cases of underlying coronary artery damage[10]. Therefore, ensuring adequate rest, reducing overall oxygen consumption, and protecting the heart are crucial considerations. For crying children can be given distracting objects, listen to soothing music or nursery rhymes.

3, NURSING OF CAL CORONARY ARTERY DAMAGE

(1) Early detection and early treatment

Young age and long fever time before intravenous gamma globulin application are high risk factors for IKD complicated with coronary artery damage. Clinical attention should be paid to the results of cardiac color ultrasound Doppler for timely diagnosis and early control of the disease in young children with incomplete Kawasaki disease. In daily nursing work, we should do daily health education, explain relevant knowledge to families and attract attention, in order to better obtain the cooperation of families, complete relevant examinations, and achieve early detection and early treatment. Painful swelling of hands and feet is a characteristic sign, with erythema of palms and soles that subsides with periungual peeling (desquamation). The latter occurs after day 10 and is considered a pathognomonic sign[11].

(2) Condition observation

When a child with IKD has coronary artery damage, the vital signs, mental state, consciousness and urine volume of the child should be closely monitored, and the doctor should be informed immediately when the condition changes[12]. In case of symptoms such as arrhythmia, emergency supplies should be prepared in advance.

(3) Medication

The combination of high-dose gamma globulin and aspirin has been shown to decrease the occurrence of coronary artery damage and myocardial infarction. Caution should be exercised in the administration of these drugs to prevent exacerbation of the condition. It is important to closely monitor the infusion rate during intravenous administration to prevent excessive speed, which could increase cardiac workload and potentially lead to heart failure. Regular monitoring is also necessary to prevent fluid leakage. After KD diagnosis, it is recommended to start high-dose IVIG treatment as soon as possible. Recommended dosage and course of treatment: Single dose IVIG (2 g/kg) is usually administered intravenously within 12-24 hours. The recommended initial infusion rate is 0.01 mL/(kg · min) [5% IVIG 30 mg/(kg · h)], maintained for 15~30 min, then increased to 0.02 mL/(kg · min), if the tolerance is good, it can be adjusted to 0.04 mL/(kg · min), and finally adjusted to the maximum speed of 0.08 mL/(kg · min)[4].

(4) Diet

During the course of treatment, children may experience a decrease in appetite as a result of oral pain, dietary restrictions, increased metabolic demands, and other contributing factors, potentially leading to malnutrition. It is recommended that a high-protein, high-calorie, and high-vitamin diet be selected, with frequent small meals. In cases of reduced appetite, consumption of acidic foods may be beneficial in stimulating appetite. Additionally, children may be prone to consuming indigestible snacks, which can result in constipation. Family members should be educated on the importance of monitoring and managing the child's diet, and in the event of constipation, both the patient and family should be informed to ensure proper care and treatment.

(5) Reduce stimulation

It is advisable to refrain from prolonged bed rest on a daily basis, as engaging in strenuous exercise, emotional excitement, and excessive stimulation may elevate cardiac workload and potentially result in various levels of arrhythmia, as well as severe complications such as coronary artery rupture and mortality. In the course of treatment, patients may engage in static activities such as assembling puzzles or building blocks.

(6) Health Education

Parents should be encouraged to have confidence in managing their child's illness by cooperating with healthcare professionals to ensure appropriate treatment. This includes prioritizing rest, avoiding strenuous physical activity, adhering to medication schedules, and maintaining a balanced diet rich in easily digestible foods, high in protein, and vitamins. It is essential to promptly educate parents about the illness and provide psychological support.

Additionally, parents should be advised to monitor their child's condition closely and schedule regular follow-up appointments. For children without coronary artery disease, it is recommended to conduct comprehensive examinations at 1 month, 3 months, 6 months, and 1 year post-diagnosis. There was close follow-up for coronary damage. Long-term management of patients with KD after the end of the acute phase at week 4 to 6 involves thrombosis prophylaxis in patients with coronary artery abnormalities and regular evaluation of coronary arteries[11].

3, Conclusion

By examining and synthesizing empirical cases, it is evident that proper evaluation, timely administration of medication, vigilant monitoring of vital signs, appropriate dietary and nutritional management, effective skin and mucosa care, proactive prevention of complications, as well as adequate psychological support and family education guidance are essential components in the care of children with iKD[13]. Furthermore, continuous refinement and enhancement of nursing protocols and techniques are necessary to enhance the quality of care provided to children in order to better address their unique needs.

Acknowledgements

We use Home for Researchers (www.home-for-researchers.com) for a language polishing service.

Reference

- [1] McCrindle BW, Rowley AH, Newburger JW, et al. Diagnosis, Treatment, and Long-Term Management of Kawasaki Disease: A Scientific Statement for Health Professionals From the American Heart Association. *Circulation* 2017;135(17):e927-e999.
- [2] Kimberly P Toole, Catherine Frank. Atypical or Incomplete Kawasaki Disease in a Young Child: A Case Report. *J Pediatr Health Care* 2019;33(4):485-488.
- [3] Blaney M M, Williams R V, Areinamo I A, et al. The impact of the American Heart Association guidelines on patients treated for incomplete Kawasaki disease[J]. *Cardiology in the Young*, 2022, 32(7): 1066-1070.
- [??] Martha Grant Fuller. Kawasaki Disease in Infancy. *Adv Emerg Nurs J* 2019;41(3):222-228.
- [5] Fukazawa R, Kobayashi J, Ayusawa M, et al. JCS/JSCS 2020 guideline on diagnosis and management of cardiovascular sequelae in Kawasaki disease. *Circ J.* 2020;84:1348-407.
- [6] Center for Diagnosis and Treatment of Kawasaki Disease/Children's Hospital of Shaanxi Provincial People's Hospital; National Children's Medical Center/Beijing Children's Hospital, Capital Medical University; Children's Hospital, Shanghai Jiao Tong University School of Medicine; National Regional Medical Center/Shengjing Hospital of China Medical University; National Clinical Key Specialty/Department of Intensive Care Medicine, Shanghai Children's Hospital; Hospital; General Pediatric Group of Pediatrician Branch of Chinese Medical Doctor Association; Expert Committee of Advanced Training for Pediatrician, China Maternal and Children's Health Association;; National Health Commission Key Laboratory for Tropical Disease Prevention and Control; Yan'an University Affiliated Hospital; Editorial Department of Chinese Journal of Contemporary Pediatrics. Evidence-based guidelines for the diagnosis and treatment of Kawasaki disease in children in China (2023). *Zhongguo Dang Dai Er Ke Za Zhi.* 2023;25(12):1198-1210.
- [7] Rowley A H, Gonzalez-Crussi F, Gidding S S, et al. Incomplete Kawasaki disease with coronary artery involvement[J]. *The Journal of pediatrics*, 1987, 110(3): 409-413.
- [8] Luisa Berenise Gamez-Gonzalez, Hiromichi Hamada, Beatriz Adriana Llamas-Guillen, et al. BCG and Kawasaki disease in Mexico and Japan. *Hum Vaccin Immunother* 2017;13(5):1091-1093.
- [9] Athanasios Gkoutzourelas, Dimitrios P. Bogdanos, and Lazaros I. Sakkas, et al. Kawasaki Disease and COVID-19. *Mediterr J Rheumatol.* 2020; 31: 268-274.

- [10] Giannouli G, Tzoumaka-Bakoula C, Kopsidas I, et al. Epidemiology and risk factors for coronary artery abnormalities in children with complete and incomplete Kawasaki disease during a 10-year period[J]. *Pediatric cardiology*, 2013, 34: 1476-1481.
- [11] Singh S, Jindal AK. Diagnosis of Kawasaki disease. *Int J Rheum Dis* 2018; 21 (1): 36-44.
- [12] Perrin L, Letierce A, Guitton C, et al. Comparative study of complete versus incomplete Kawasaki disease in 59 pediatric patients[J]. *Joint Bone Spine*, 2009, 76(5): 481-485.
- [13] Cho K H, Kang S J. Clinically useful predictors of resistance to intravenous immunoglobulin and prognosis of coronary artery lesions in patients with incomplete Kawasaki disease[J]. *Korean circulation journal*, 2014, 44(5): 328-335.

UNDER PEER REVIEW