

Kawasaki disease: symptoms, causes and treatment



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1. Background

Kawasaki disease (KD) is a systemic vasculitis syndrome which may involve many organs, such as myocardium and the conduction system, and may cause inflammation in other organs such as pericarditis, endocarditis, cholecystitis etc.

- Etiology

There is only little information of the etiology of KD. It is suspected as an infectious disease with an unknown pathogen (Kato&Suda, 2012) or autoimmune disease (Starkebaum, 2013) that has an acute systemic vasculitis syndrome.

- Prevalence

KD is a prevalent cardiac disease in Asia, North America, South America, Europe and Australia. Nakamura and Yanagawa (2004) stated that Asians were approximately 5-10 times more susceptible than white persons. (cited in Kato&Suda, 2012)

Hong

Kong

Kawasaki

Disease

Study

Group

reported

the local

incidence

of KD was

31. 2 per

100, 000

children

aged

below 5

and the

male to

female

ratio was

1. 63 in a

6 year

surveillan

ce study.

(Ng et al,

2001, as

cited in

Cheng,

Wong&So

in 2003)

II. Clinical understanding of Kawasaki's Disease

- Medical diagnostic criteria

The principal diagnostic criteria of KD are presence of at least five of the major features: persistent fever for at least 5 days, conjunctival injection,

changes in the mucosa of the oropharynx (such as strawberry tongue), changes in the peripheral extremities, erythematous rash over extremities or/and trunk, and cervical lymphadenopathy. If clients do not fulfill the classic criteria, they are considered as having incomplete KD. (Kato & Suda, 2012)

- Difference between Roseola disease and Kawasaki disease

Both Roseola and Kawasaki disease begin with sudden high fever, but their treatments are very different. The fever of KD is not very responsive to acetaminophen or ibuprofen which can be used to treat the fever of Roseola. After the fever, KD and Roseola cases both develop rash but their onsets of rash are not the same. Roseola case develops rash at the time of fever resolution, while KD case develops rash within two to three weeks after the onset of fever which may not be resolved. (Wang et al., 2009) Also, KD presents with some oral manifestations, like erythema, edema, fissuring of lips and a “strawberry tongue” which cannot be found in Roseola cases. (Ely & Seabury, 2010)

II. Clinical understanding of Kawasaki's Disease

- Potential Complications

Children with Kawasaki's disease can develop vasculitis that causes weakening of the blood vessels and leads to aneurysms. Without treatment in time, 1 in 5 children with Kawasaki disease will develop coronary aneurysms. (Suzuki et. al., 1986) Either formation of blood clot in a coronary artery aneurysm or rupture of a large coronary artery aneurysm would lead to myocardial infarction which may cause death.

Besides the coronary arteries, the myocardium, valves, and pericardium can become inflammatory. Arrhythmias or abnormal functioning of some heart valves, myocardial infarction and heart failure may also occur.

- Standard Treatments in Hong Kong

Guided by the Hospital Authority in Hong Kong, intravenous gamma-globulin (IVGG) and aspirin are the treatment protocols for all KD clients admitted to hospital. (Yung et. al., 2002)

For evaluating the coronary artery lesions, echocardiography are done for all patients and coronary angiography and heart catheterization are performed for selective clients.

III. Case study and its nursing assessment

Peter, a 1-year old baby, has been diagnosed as having Kawasaki Disease after admission. Peter is now suspected at the acute phase (Stage I) of the disease since he shows irritability, persistent fever for 4 days and erythematous rash over his extremities.

For subjective data, he has high fever and diarrhoea for few days; fever was lower after treating with antipyretics and diarrhoea was subsided and rashes developed over his entire hands, arms, feet and legs, stated by his mother.

For objective data, he is irritable, has a bright red tongue; his palms and soles had erythematous rash.

In most of the cases, clients also have conjunctivitis, swollen cervical lymph nodes, inflammation of the pharynx and the oral mucosa develops with red

and cracked lips and swollen joints. Beside of developing erythematous rash, skin on the extremities may be edema and peeling. Mostly, clients suffer from cardiac problems, such as myocarditis and tachycardia. (Starkebaum, 2013) These should be assessed after admission.

IV. Plan for care

- Nursing diagnosis for the case study

1. Hyperthermia related to inflammatory disease process, increased metabolic rate and dehydration as evidenced by body temperature greater than normal range
2. Risk for decreased cardiac tissue perfusion related to vasculitis
3. Impaired oral mucous membrane related to inflammatory process, dehydration, and mouth breathing as evidenced by presence of bright red tongue
4. Impaired skin integrity related to inflammatory process, altered circulation as evidenced by having erythematous rash over palms and soles and his mum's verbalization of presence of rash over extremities
5. Risk for imbalanced nutrition: less than body requirements related to inflammation and swollen of oral mucous membrane and tongue
6. Ineffective family therapeutic regimen management related to knowledge deficit to Kawasaki disease as evidence by wrongly distinguishing Roseola and Kawasaki Disease

- Nursing Management s

1. Management for H yperthermia

To treat hyperthermia, cooling should be promoted by wearing lightweight and loose-fitting clothing. This can encourage heat loss by radiation and conduction. Ice bags can be put on the forehead or around neck of client. Adequate water intake is also encouraged. In order to prevent complications and promote comfort, before administering aspirin, nurses should monitor temperature every 4 hours until client becomes afebrile for a day. Administer antipyretic medication if prescribed.

Peter, in the case study, was treated with antipyretics before so his fever was lower. Continuous temperature monitoring is required. Also, increasing his fluid intake promotes recovery and prevents dehydration. Peter will be afebrile, checked with thermometer, and free of complications due to high-grade fever within 3 days.

2. Management for Risk of complications and infection

At the acute phase of KD, nurses should monitor client's cardiac condition closely by assessing client's cardiac status regularly, i. e. once a day, including measuring the apical rate, along with assessing any symptoms of shortness of breath and SaO₂ level of client. Continuous monitoring is still suggested even though no S/S has shown up. The goal is that Peter will not develop any complications before discharge. Assessing any worsening condition is for evaluating nursing interventions in preventing complications.

Once cardiac complications start to develop keep strict I/O and monitor SaO₂ Q4H. Administer supplementary oxygen as prescribed. If client continues irritable and shows cyanosis, administer sedation as prescribed to reduce oxygen consumption and cardiac workload. Long term FU is required.

In addition, note the presence of compromised vision of patient. Bilateral conjunctival inflammation was reported to be the most common symptom of Kawasaki disease after fever. (Yun et al., 2011) Note for any redness and assess the visual ability at regular time intervals.

If Peter is suspected having compromised vision, assessed by providing vision stimuli to see any respond, consult ophthalmologist if possible.

3. Management for Impaired skin integrity and oral mucous membrane

Most of the KD clients will have erythematous rash over body, altered mucous membrane condition and 'strawberry' tongue, as mentioned.

Client's skin condition is assessed at regular time intervals. Also, nurse can apply emollients to affected area as ordered, and educate parents and help client to wear soft and loose clothing. Promoting nutritional status and encourage fluid intake are important in healing of rash. For the mucosal conditions, we should provide client mouth care, lubricate his lips and provide adequate clear liquid if not contraindicated.

In Peter's case, the aims are preventing lesion and promoting healing of the rash of his extremities and inflamed tongue within two weeks. Also, maintaining intact and moist oral mucous membrane that are free of inflammation, ulceration and infection before discharge. The oral condition will not affect his appetite, so as the nutritional status, evaluated by assessing his body weight daily.

4. Management for Altered comfort

Client suffered from KD often shows irritability due to pain and fever. (To deal with fever, please refer to *Management for hyperthermia*) Administer analgesia as prescribed to reduce the pain.

A quiet environment may calm client, nurses can talk softly and avoid bright light if possible. James et al.(2013) suggested that line the bed with soft blanket from home can promote client's sleeping quality. Encourage parents' to bring client's favourite toys and nipple may also help in comforting client. Nurse should manage the procedure systematically, in order to minimize disrupting client's rest period. These actions can apply in Peter's case. Peter will have adequate rest and show clam immediately after having these nursing actions.

- Family Education

Some parents may not know what Kawasaki disease is. Nurses should provide information to client's family and answer the inquiries. Client's parents are often anxious of clients' condition. Assessing the parent's anxiety level and explaining procedure clearly are necessary. Nurse should also comfort parents by assuring them the fever, pain and irritability of the child will resolve eventually.

Focusing on the case scenario, nurse should help his mother to differentiate the differences between KD and Roseola, including the etiology and S/S, after Peter's admission. To reduce the chances of developing complications, nurse can teach his mother to monitor and assess early signs of complications of heart at the routine time, such as abnormal heart rate, arrhythmia, cyanosis and lower extremities edema. Provide pamphlet about

KD for his mother to read. Asking for any inquiry and let her to verbalize at least two significant signs of having complications can evaluate her understanding.

To prevent further infection, client's carer should be educated to provide proper hand hygiene before touching client. It is also encouraged if we can invite her in planning the treatment regimen, which can reduce her anxiety and promote her compliance to client's treatment regimen.

Besides, since Peter is 1-year old, before Peter discharges, we should educate the mother that after IVGG treatment, vaccinations with live vaccine (e. g. MMR) should be delayed for 6 months. It is because antibodies may interfere with the immune responses to the vaccines (Salisbury & Begg, 1996, as cited in Cheng, Wong & So, 2003). We should make sure his mum remembers the specific dates of FU in order to detect abnormalities showing signs of potential complications.

V. Conclusion

Kawasaki Disease is a common paediatric disease, and it is different from Roseola. With early diagnosis, treatment and continuous follow-ups, it is a manageable and curative disease.