Original Article

Clinical aspects and laboratory tests of Kawasaki Disease in Iran

Mohammad Bagher Rahmati[1], Keramat Allah Jahanshahi[2], Zahra Jahangiri[2], Hamidreza Mahboobi[2,3], Tahereh Khorgoei[4]

[1.] Assistant professor, Pediatric department, Hormozgan University of Medical Sciences (HUMS), Hormozgan, Iran
[2.] Infections and Tropical Disease Research Center, Hormozgan University of Medical Sciences (HUMS), Hormozgan, Iran
[3.] Payam Noor University (PNU), Tehran, Iran
[4.] Cardiovascular Disease Research Center, Hormozgan University of Medical Sciences (HUMS), Hormozgan, Iran

mbrahmati@yahoo.com

ABSTRACT

Background: Kawasaki Disease (KD) is a self-limiting vasculitis and is the main cause of acquired cardiac disease in childhood in developed countries. Early diagnosis and treatment of KD is necessary for prevention of cardiac complications in adolescence. The aim of the present study is to assess clinical aspects and laboratory tests in KD in Iran.

Methods: The study, undertaken in 2009, included all patients admitted to Kudakan hospital in Bandarabbas with a diagnosis of KD during 1997 to 2008. Forty-two children were included in this study. Seven patients were excluded because of incomplete records. All eligible patients' records were reviewed and data including age, sex, clinical findings, and laboratory test results were summarized in a structured checklist. Data were analyzed using SPSS 13.0 for Windows (SPSS Inc., Chicago, Illinois, USA) software.

Results: Among the 35 patients studied, seven (20%) were female, and 28 (80%) were male. Mean age of the patients was 3.35±2.4. Fever was seen in 35(100%) patients, noninfectious bilateral conjunctivitis in 16(45.71%), noninfectious unilateral conjunctivitis in two (5.7%), lip color change in 18(51.4%), involvement of oropharynx in 19(54.3%), strawberry tongue in 11(31.4%), maculopapular rash in 18(51.4%), and erythmatous skin in six (17.1%). Ten patients had an erythrocyte sediment rate (ESR) less than 30.

Conclusion: Prevalence of clinical findings in Iran is variable among different areas. Thus KD should be considered in all children with fever lasting five days or longer to prevent cardiac complications in future.

Bibliographic Information of this article:
[Mohammad Bagher Rahmati, Keramat Allah Jahanshahi, Zahra Jahangiri, Hamidreza Mahboobi, Tahereh Khorgoei. **Clinical aspects and laboratory tests of Kawasaki Disease in Iran**. Electronic Physician, 2012;4(1):461-464]. Available online at: http://www.ephysician.ir/2012/461-464.pdf . (ISSN: 2008-5842). http://www.ephysician.ir

Keywords: Kawasaki Disease; Clinical Aspects; Laboratory Tests

1. Introduction

Kawasaki Disease (KD) was described by Tomisaka Kawasaki in 1960 and may occur in any child regardless of race and ethnicity (1). Reports of the condition among adult patients are rare (2). KD is a self-limiting vasculitis but is considered significant because of its risk of secondary cardiac problems such as coronary artery aneurism and myocarditis (1). KD is the main cause of acquired cardiac disease in childhood in developed countries. It is most prevalent in Japan, Korea, and Taiwan (3). In some countries, its prevalence appears to be increasing. However, this may be an artifact introduced by improved diagnosis (4). In some cases, the diagnosis is very difficult and knowledge of the classic characteristics of the disease may be inadequate for diagnosis (5).

Clinical presentation of KD is different among various age groups. Non-characteristic presentation in patients under 1 year old, and failure to respond to intravenous immunoglobulin (IVIG) in patients over 5 years old, increases the prevalence of cardiovascular complications among these groups of patients (6). Pyuria is seen more commonly in KD when compared to other febrile disease, but this marker is neither specific nor sensitive for this disease (7). Biological markers effective in KD and its mechanisms aren't completely understood yet (8).

Early diagnosis and treatment of KD is necessary for prevention of cardiac complications in adolescence. The aim of the present study is to assess clinical aspects and laboratory tests in KD in Iran.

2. Material and Methods

This study was undertaken for a medical student thesis and as such was approved by the research committee of Shariati medical school in Hormozgan University of Medical Sciences (HUMS). The study, undertaken in 2009, included all patients admitted to Kudakan hospital in Bandarabbas with a diagnosis of KD during 1997 to 2008. Kudakan hospital is the only educational pediatric hospital in Bandarabbas serving Hormozgan University of Medical Science (HUMS). Bandarabbas is the largest and most populated city in the Hormozgan province, located in southern part of Iran. The climate is hot and humid.

Forty-two children were included in this study. Seven patients were excluded because of incomplete records. Thus, 35 records were assessed.

The criteria for diagnosis of KD in these patients were:

1- Fever lasting five days or longer

2- Four of these five clinical finding:

- Polymorphous rash
- Bilateral conjunctival injection
- Cervical lymphadenopathy (at least one lymph node >1.5 cm in diameter)
- Injected or fissured lips, strawberry tongue, injected pharynx
- Erythma and edema in palms and soles and delayed desquamation

3- Negative blood and urine culture and clinical examination for infective causes and other disease.

Patients with "incomplete KD" were also included in this study. Such patients had fever lasting five days or longer but had less than four of the relevant clinical findings. All eligible patients' records were reviewed and data including age, sex, clinical findings, laboratory test results and also their echocardiography results and treatments were summarized in a structured checklist. Patients' names were not recorded; instead a code was used for each patient to protect anonymity.

Data were analyzed using SPSS 13.0 for Windows (SPSS Inc., Chicago, Illinois, USA) software. Descriptive statistics (Mean, Standard Deviation, Frequencies) were used for analysis.

3. Results

Among the 35 patients studied, seven (20%) were female and 28 (80%) were male. Mean age of the patients was 3.35±2.4. Ages ranged from 6 months to 9 years. Six patients (17.14%) were less than 1 years old and seven (20%) were more than 6 years old. Twelve (34.27%) patients were admitted in winter, 11(31.42%) in spring, seven (20%) in summer and five (14.28%) in autumn.

Fever was seen in 35(100%) patients, noninfectious bilateral conjunctivitis in 16(45.71%), noninfectious unilateral conjunctivitis in two (5.7%), lip color change in 18(51.4%), involvement of oropharynx in 19(54.3%), strawberry tongue in 11(31.4%), maculopapular rash in 18(51.4%), and erythmatous skin in six (17.1%). Also six (17.1%) patients had maculopapular rash with erythematous skin.

Unilateral lymphadenopathy (More than 1.5 cm in diameter) was seen in six (17.1%) patients and bilateral lymphadenopathy in nine (25.7%). Involvement of extremities was seen in eight (22.9%) with erythma, in four (11.4%) with edema, in seven (20%) with skin desquamation. One patient had platelet count less than 100,000, and two patients had platelet counts of more than 600,000. (See Chart 1) Ten patients had an erythrocyte sediment rate (ESR) less than 30. White Blood Cell (WBC) counts were less than 100,000 in 17 (48%) of patients, between 10,000 to 15,000 in 12 (34%), and more than 15,000 in six (28%) patients. CRP was not raised in 12(34%) patients. Twelve (34%) patients had hemoglobin level less than 10mg/dl, 10(28%) had hematocrit less than 30%, 17(48%) between 30-35, and eight (22.8%) more than 35%.

4. Discussions

Patients' ages in our study were similar to previous studies in Iran. All of these studies reported some cases less than 1 year old. In Esfahan, the authors reported some cases up to 13 years old (9)but all cases in our study were less than 10 years old. Male to female ratio was 4:1 in our study, which is similar to studies done in Kermanshah

(10). Also in Esfahan, Kashan (11), Tehran (12), and Mazandaran (13) KD was more prevalent among males than females. One study from Qazvin showed KD to be more prevalent among females (M/F=0.45).

About 65% of cases were admitted in spring and winter in our study. Similar results were reported from Kermanshah, Qazvin (14), Kashan and Tehran. But in Mazandaran (13) KD was more prevalent in autumn. Fever was seen in 100% of patients and this finding was compatible with other report in Kermanshah, Qazvin, Esfahan, and Kashan. This is unsurprising as this is a major diagnostic criteria for KD, and thus an inclusion criteria, for the study.

In our study, changes in oral mucosa and lip were the most prevalent clinical findings after fever. This was compatible with studies in Qazvin and Kashan. In Kermanshah and Esfahan, the most prevalent clinical finding after fever was noninfectious conjunctivitis. Noninfectious conjunctivitis was more prevalent among KD patients in Kermanshah, Qazvin, Esfahan, and Kashan than in this study. Cervical lymphadenopathy was seen in 42.8% of KD patients in our study but this was seen in 65.2% of patients in Kermanshah, in 58.6% in Qazvin, in 62.2% in Esfahan, in 67% in Kashan, and in 70% of patients in Tehran.

Skin rash was seen in 51.4% of patients in our study and was compatible with similar study in Qazvin. In studies in Kermanshah, Esfahan and Kashan this finding was more prevalent. The prevalence of changes in extremities in our study was similar to studies in Kermanshah, Qazvin, Esfahan, Kashan, and Tehran. Platelets count was less than 400,000 in 37% of patients in our study. This rate was lower than other studies in Iran. Also thrombocytosis was seen in 8.44% of patients in Qazvin and was lower than our study. Studies in Esfahan and Kashan reported thrombocytosis in 74.3% and 71% of patients respectively. An ESR level of more than 30 was seen in 48.5% of our patients, but this rate was 75.9% in Qazvin, 93.3% in Esfahan, 91% in Kashan, and 80% in Tehran. Raised CRP was reported in 23 (65.7%) of our patients and was almost compatible with studies in Qazvin and Esfahan.

5. Conclusion

KD is seen in children less than 1 year old to about 13 years in studies in Iran. It appears to be more prevalent in males and occurs most frequently in spring and winter. Prolonged fever is the most common clinical finding followed by noninfectious conjunctivitis and changes in oral mucosa and lips. But the prevalence of these latter presentations is variable among different studies undertaken in Iran. Prevalence of clinical findings in Iran is variable among different areas. Thus KD should be considered in all children with fever lasting five days or longer to prevent cardiac complications in future.

Acknowledgements:

This article is the result of a medical student thesis approved by the research committee of medical students' thesis at Hormozgan University of Medical Science (HUMS). The authors also want acknowledge Elizabeth Cottrell (University Hospital of North Staffordshire NHS Trust/Keele University) for language editing of the paper.

Corresponding Author:
Mohammad Bagher Rahmati
Hormozgan University of Medical Sciences (HUMS)
Bandar Abbas, Iran
E-mail: mbrahmati@yahoo.com

References

1. Burns JC. Kawasaki Disease update. Indian J Pediatr. 2009 Jan;76(1):71-6.
2. Sbidian E, Lacert A, Perrin P, Le Cleach L. [Adult Kawasaki disease]. Ann Dermatol Venereol.2009 Mar;136(3):260-3.
3. Huang WC, Huang LM, Chang IS, Chang LY, Chiang BL, Chen PJ, et al. Epidemiologic features of Kawasaki disease in Taiwan, 2003-2006. Pediatrics2009 Mar;123(3):e401-5.
4. Kushner HI, Macnee RP, Burns JC. Kawasaki disease in India: increasing awareness or increased incidence? Perspect Biol Med2009 Winter;52(1):17-29.
5. Thapa R, Chakrabartty S. Atypical Kawasaki disease with remarkable paucity of signs and symptoms. Rheumatol Int. Rheumatol Int. 2009 Jul;29(9):1095-6. doi: 10.1007/s00296-009-0899-2. Epub 2009 Apr 21. Pubmed PMID: 19381640.

6. Song D, Yeo Y, Ha K, Jang G, Lee J, Lee K, Son C, Lee J. Risk factors for Kawasaki disease-associated coronary abnormalities differ depending on age. Eur J Pediatr. 2009 Nov;168(11):1315-21. doi: 10.1007/s00431-009-0925-0. Pubmed PMID: 19159953.
7. Hike H, Kanegaye JT, Best BM, Pancheri J, Burns JC. Pyuria Associated With Acute Kawasaki Disease and Fever From Other Causes. Pediatr Infect Dis J. 2009 May;28(5):440-3. doi: 10.1097/INF.0b013e318193ec8e. Pubmed PMID: 19319019.
8. Yu HR, Kuo HC, Sheen JM, Wang L, Lin IC, Wang CL, Yang KD.. A unique plasma proteomic profiling with imbalanced fibrinogen cascade in patients with Kawasaki disease. Pediatr Allergy Immunol. 2009 Nov;20(7):699-707. doi: 10.1111/j.1399-3038.2008.00844.x. Pubmed PMID: 19170925.
9. R. Kordidarian, A.Kazemi, A.Nikyar, M.Torfeh Nejad. Assessing Kawasaki disease in children at Alzahra hospital (1995-1999); Journal of Qazvin University of Medical Sciences; 2004; 11(4): 42-47
10. Gheini S, Hemati M, Arghavanifard P. Characteristics of Kawasaki patients in Kermanshah Hospitals during 1997-2000 (Persian). Behbood 2004; 8 (3): 51-62
11. Mohamamd Reza Tashakkor , Zahra Chavoshzadeh and Abbas Doroodgar. Report on 21 cases of Kawasaki disease from Shahid Beheshti Hospital of Kashan in the years 1375-77. KAUMS Journal (FEYZ). 1999; 3(3):61-7
12. Tavasoli S, Farnaghi F.Clinical and laboratory assessment of Kawasaki Disease in Loghman and Mofid hospital in Tehran. Scientific Journal of Ilam University of Medical Science; 1384; 13(1): 59-64
13. Saffar Mi, Reshidighader F. Kawasaki disease in East Mazandaran, Islamic Republic of Iran, 1997-2002. East Mediterr Health J. 2005;l1(1-2):28-35.
14. Ayazi P, Mohammadzade GH, Arianfar F. Clinical Symptoms and laboratory findings of Kawasaki disease in children. Journal of Qazvin University of Medical Sciences. 2007; 11(1):28-33.