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Olgu Sunumu

Facial nerve palsy associated with Kawasaki disease: A case report and review of the literature

Fasiyal sinir paralizisinin eşlik ettiği Kawasaki hastalığı: Bir olgu sunumu ve literatürün derlenmesi

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ABSTRACT

Facial nerve palsy is a rare neurologic manifestation of Kawasaki disease. There are several mechanisms in the pathogenesis of facial nerve palsy. It is usually transient and lasts for 1 to 90 days. Under normal conditions it resolves spontaneously and completely. Presence of facial paralysis indicates an increased risk of coronary artery aneurism. In this report, a ten month- old girl with prolonged fever, aseptic meningitis and facial palsy who later diagnosed as Kawasaki disease was described and also the clinical features of 37 cases in the literature were reviewed.

Key words: Kawasaki disease, facial nerve palsy, children

ÖZ

Fasiyal sinir paralizisi, Kawasaki hastalığının ender görülen nörolojik bir bulgusudur. Fasiyal sinir paralizisinin oluşumu ile ilgili birkaç mekanizmadan bahsedilmektedir. Genellikle geçici olup, 1-90 gün sürer. Normal şartlar altında kendiliğinden tamamen iyileşir. Fasiyal sinir paralizisi saptanması halinde, artmış koroner arter anevrizma riskinin olduğundan bahsedilir. Bu makalede, uzamış ateş, aseptic menenjit ve fasiyal paralizisi olan ve sonradan Kawasaki hastalığı tanısı konan 10 aylık kız çocuğu, literaturde sunulan olgular ile birlikte derlenerek bildirilmiştir.

Anahtar kelimeler: Kawasaki hastalığı, fasial sinir paralizisi, çocuk

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INTRODUCTION

Kawasaki disease (KD) is an acute febrile illness of childhood. Although it was first described by Dr. Tomisaku Kawasaki in 1967 in Japan, it is seen worldwide in all populations. Still the highest incidence is seen in children of Asian descent [1,2].

The cause of the illness remains unknown, but epidemiologic and clinical features clearly suggest an infectious cause. KD is systemic, severe vasculitis that predominantly affects small and medium-sized arteries, with a predilection for the coronary arteries. KD is the leading cause of acquired heart disease in children in most developed countries, including the USA and Japan [2,3].

Neurologic manifestations have been reported to occur in %1.1 to %30 of cases of KD. These manifestations include irritability, lethargy, aseptic meningitis, ataxia, seizures, focal encephalopathy, cranial nerve palsies, cerebral infarction, subdural effusion, senserineural hearing loss and transient hemiplegia [4-10]. Facial nerve palsy (FNP) is among the rarest neurologic complications that have now been reported in literature in only 37 cases.

A ten month- old girl with prolonged fever, aseptic meningitis and facial palsy who later diagnosed as KD is described and also the clinical features of 37 cases in the literature are reviewed.

CASE REPORT

A 10-month-old girl was admitted to a primary health center with a febrile illness with body temperature of 39°C. She was diagnosed as non-exudative pharyngitis and empirically oral antibiotic was prescribed to her. At the end of 2nd day of fever, bilateral conjunctival injection, maculopapular rash, erythema of the oral mucosa with strawberry tongue and dry cracked lips accompanied her complaints. After that she was admitted to a general hospital. Erythema at BCG inoculation site was detected by her mother. The focus of fever had not been found, blood and urine examination revealed elevation of acute phase reactants and leukocyturia which necesitated initiation of intravenous antibiotic treatment (sulbactam/ampicilline). No causative organism was found on blood and urine cultures. Maculopapular rash was resolved in a few days. On 8th day of fever there was indurative edema of hands and feet. She was hospitalized for 6 days but her fever continued at high levels, and left-sided peripheral facial nerve palsy (FNP) was noticed at the end of 14th day. Computed tomography of her brain was normal. She was referred to a local university hospital. On her physical examination she was febrile, tachycardia, irritability, bilateral edema on her hands and feet and left-sided peripheral FNP. were detected. Other neurologic findings were normal.

Laboratory investigations performed in the local university hospital revealed a mild normocytic normochromic anemia (Hb:9.9 mg/dL) leukocytosis ($25.2x10^9$/L with %76 neutrophils), a mild trombocytosis ($509x10^9$/L), a raised C-reactive protein levels (139.5 mg/L [reference range: 0-5 mg/L], elevated erythrocyte sedimentation rate (120 mm/hr), and leukocyturia. Cerebrospinal fluid (CSF) examination revealed presence of leukocytes ($100/mm^3$), CSF protein (51 mg/dL; reference range 10-40 mg/dL), and CSF glucose (49 mg/dL), blood glucose (152 mg/dL) but CSF clture but no organism grew in culture. Serologic testing was negative for herpes simplex viruses tip 1 (HSV1) and HSV2, Epstein-Barr virus, *Mycoplasma pneumoniae, cytomegalovirus*. *Brucella* and *salmonella* tube agglutination tests were also negative. Throat, urine and fecal cultures were negative for bacterial and viral pathogens. Her lipid profile and ferritin level were within normal limits. Serum albumin level was relatively lower (2.0 mg/dL [reference range: 3.5-5.4 g/dL]. The other laboratory findings were within normal limits. Meropenem and vancomycin were given to the patient who was considered to be meningitis. Cranial magnetic resonance imaging findings were within normal limits. Facial palsy was evaluated as Bell's palsy by otolaryngologist. Her FNP partially resolved spontaneously within 10 days without treatment but nasolabial fold was slightly absent and corner of the mouth drooped also slightly when she cried. Despite meropenem and vancomycin treatment at 25th day, fever could not be controlled and she was referred to our university hospital.

On her physical examination in our center she was febrile, irritable, bilateral minimal indurative edema on her hands and feet, desquamation of digits and a slight nasolabial fold absency defined when she was cried. The other physical examination was normal.

KD was diagnosed and echocardiography demonstrated, dilatation of the proximal right coronary artery (RCA). Diameters of left main coronary artery, and RCA were 2.4 mm, and 3.8 mm, respectively. There was mild mitral valve incompetence.

The patient was treated with high dose intravenous immunoglobulin (IVIG) (2 g/kg infused over 12 hours) and aspirin (100 mg/kg, per day). Her fever and FNP resolved completely within 48 hours of IVIG treatment.

DISCUSSION

The classification criteria for Kawasaki Disease,

include fever lasting for 5 days or longer and at least four of the following five signs: nonpurulent conjunctivitis, rash (polymorphous erythematous), hyperemic lips and/or mucous membranes, changes in the extremities (peripheral edema, peripheral erythema and periungual desquamation), and cervical adenopathy (usually unilateral) [11].

Facial nerve palsy is a rare neurologic complication of KD. The first case was documented in 1974 by Murayama [5]. Facial nerve palsy was accepted as one of the significant neurologic symptoms or findings of KD in the Japanese diagnostic guidelines published in 1984 [12]. A total 37 additional cases have been reported to date in literature. The clinical features of these cases are shown in Table 1.

Kawasaki disease occurs predominantly in young children; 80% of patients are under 5 years old and the male-to-female ratio is 1.5:1 [2,3]. The age of onset

Table 1. Clinical features of 37 patients of KD with facial palsy.

Patient	Age	Sex	Side	Onset of facial palsy	Duration of facial palsy	Cardiovascular involvement	IVIG therapy	CSF WHITE/RED CELLS
1 (13)	2	F	L	12	5	CAAB	After	30
2 (14)	3	F	L	12	7	CAAB+ Axillar Artery	None	26
3 (15)	3	M	L	36 Hours	2	CAAB	After	7 /26
4 (16)	3	M	L	12	5	CAA	None	Normal
5 (8)	3	M	L	25	2	CAAB	After	Heavily Blood
6 (17)	5	M	R	11	42	CAAB	After	
7 (4)	6	F	L	18	21	NONE	None	Normal
8 (18)	6	F	L	16	60	NONE		Normal
9 (19)	6	M	L	11	28	CAAB	None	Unknown
10 (19)	7	F	L	16	12	CAAB		Unknown
11 (20)	7	F	R	17	30	NONE	Before	37
12 (8)	7	M	L	-	A Few	CAAB+Axillar Arter	None	Unknown
13 (21)	7	M	L	37	26	NONE		Normal
14 (19)	8	M	R	14	16	CAAB		Unknown
15 (22)	8	M	R	2	11	NONE		
16 (4)	9	F	R	10	10	NONE		Unknown
17 (4)	9	F	L	7	60	CAA		Unknown
18 (18)	9	F	R	19	60	NONE		Normal
19 (23)	10	F	R	10	90	NONE		10
Our case	10	F	L	14	12	CAAB	After	100
21 (9)	11	F	R	-	60	CAA	Before	
22 (6)	11	M	L	18	20	CAAB		60
23 (22)	13	F	L	16	11	NONE		
24 (24)	13	F	L	12	16	CAAB		Unknown
25 (5)	13	M	L	17	Present At Death	CAAB+Axillar Arter+İliac		Unknown
26 (25)	13	M			Present At Death	Arter		123
27 (4)	14	F	R	22	14			21
28 (9)	14	M	L	17	30	NONE	Before	
29 (19)	15	F	R	16	13	CAAB		Unknown
30 (26)	24	M	R	17	30	CAAB	Before	
31 (4)	25	F	L	16	60	NONE		24
32 (27)	72	M	L+R	10+12	23+82	CAA	Before-After	
33 (28)	156	M	L	12	10	CAAB	Before	
34 (10)			L	26	30	CAA		
35 (29)					Death	CAA		
36 (30)					7			
37 (30)					7			
38 (31)								

CAAB: coronary artery aneurysm bilateral, CAA: coronary artery aneurysm

Only 37 patients with KD disease complicated by facial palsy have been reported previously (Table 1), and the addition of our patient makes a total of 38. All but 3 were younger than 24 months when the disease developed. There were 17 girls and 16 boys (gender not reported in 5), for a female-to-male ratio of 1.06:1. The mean onset of facial palsy after the first symptoms of KD was 14 days (range 36 hours to 37 days). In all but 1 cases where the side was noted, the facial palsy was unilateral (22 on the left, 12 on the right) and peripheral. In nearly all cases, it was transient, lasting 2 days to 3 months. Two patients who died had persistent facial palsy at the time of death [5,25]. Cerebrospinal fluid examination was reported in 16 patients, of whom 10 had pleocytosis. Among 33 patients in whom echocardiography was performed, 22 had CAA which was unilateral in 6 and bilateral in 16. Axillar artery aneurysm in three cases and iliac artery aneurysm in a case were detected. Patient 25 died while the facial palsy was still present. In the other 21 patients with CAA, the facial palsy lasted from 2 to 82 days. In the patients without CAA, it lasted from 2 to 90 days. Only eleven patients received IVIG therapy, either before or after the facial nerve involvement was apparent. Their facial palsy lasted 2 to 42 days, compared with 10 to 60 days in patients who did not receive IVIG.

of KD complicated by facial nerve palsy ranged from 2 months to 13 years, but most of the patients were younger than 24 months. Only 3 cases have been reported over 2 years in the literature who were 25 months old, 6 years old and 13 years old, respectively. Generally, males are more commonly affected than females in KD, and there was female predominance in facial nerve palsy associated with KD in the literature. However; a higher rate of male cases of facial nerve palsy associated with KD have been reported during the last decade. All facial nerve palsies documented to date have been unilateral except one, and there is approximately a 3:5 left side predominance.

Kawasaki disease causes severe vasculitis of all blood vessels but predominantly affects the small and medium-sized arteries. It is not clear whether the etiologic agent, or the immune response of host, or both of them are present or not. There are several pathogenetic mechanisms of facial nerve palsy. Amano and Hazama documented histopathologic findings of nervous system in autopsied children who had died as a result of KD [25]. Ganglionitis and neuritis of cranial and peripheral nerves, and endarteritis, periarteritis, aseptic choromeningitis and leptomeningitis were found by these authors [25]. The occurrence of facial nerve palsy can be attributed to ischemia of the facial nerve below the level of the facial nerve nucleus. Ischemia is probably associated with vasculitic inflammation of attendant arteries supplying facial nerve. Also immunologic mechanisms can probably contribute to the occurrence of facial nerve palsy [4,9,13,15,26].

Facial nerve palsy associated with KD was noted at intervals ranging from 2 to 37 days after onset of illness. It is usually transient and lasts from 1 to 90 days. With spontaneous, slow and complete or with treatment, rapidly and complete recovery is the rule for those who survive acute phase Kawasaki disease [13,15,17]. Facial nerve palsy that treated with IVIG is seemed to shorten the time to full recovery in Table 1. The most rapid improvement with IVIG occurred within 36 hours in a patient who was reported by Bushara et al. [15].

Cardiovascular disorders are the most important manifestation of KD. Coronary artery aneurysms develop in up to 25% of untreated patients in the subacute phase of illness [2,27]. The patients who had KD complicated by facial nerve palsy, cardiac activation was found out among the 66% of them, whose personal information was available within these patients the ratio of bilateral coroner involvement is %72.

CSF pleocytosis is a common feature of acute KD and occurs in approximately one-fourth to one-third of patients [32,33]. In the study by Dengler et al. [34] 18 of 46 (39.1%) KD patients who underwent LP during their acute illness had a CSF pleocytosis (>6 WBC/mm^3). The basis for the CSF pleocytosis in patients with acute KD remains unknown [33]. It was speculated to be the result of the symptoms of systemic vasculitis or the result of vascular leakage through the blood-brain barrier [35]. In another autopsied study, varying degrees of inflammatory changes in brain vasculature (leptomeningeal thickening, mild endarteritis, and periarteritis) was noted [33].

CSF pleocytosis was found in six of 10 patients with KD complicated by facial nerve palsy who had lumbar puncture in the study by Gallagher [23]. CSF pleocytosis was found in ten of 16 patients by recently reported cases. This finding supports that a substantially higher proportion of CSF pleocytosis persists in this patients.

Because of cardiac findings, other vascular aneurysms and CSF abnormalities are mostly found in the patients who are complicated by facial nerve palsy, this finding may be an indication of that KD would suggest a more serious disease [17,23,26].

In our patient, a ten month old girl, the left sided facial nerve palsy was noticed on 14th days of onset of illness. During 10 days partially resolved and within 2 days after IVIG treatment completely recovered. Dilatation of right coronary artery returned to normal on the control echocardiography performed after three weeks.

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