



Clinical and Demographic Properties of Hand-Foot and Mouth Disease

El-Ayak-Ağız Hastalığının Klinik ve Demografik Özellikleri

Hand-Foot-Mouth Disease

Alaaddin Yorulmaz¹, Nuran Karaca Onat²

¹Çocuk sağlığı ve hastalıkları Kliniği, ²Dermatoloji Kliniği, Konya Beyhekim Devlet Hastanesi, Konya, Türkiye

Özet

Amaç: El-ayak-ağız hastalığı (EAAH), enterovirüs ailesinin deri ve mukozada lezyonlar oluşturduğu, çoğunlukla komplikasyonsuz seyreden sistemik bir enfeksiyonudur. Bu çalışma ile hastanemize başvuran ve EAAH tanısı alan hastaların klinik özelliklerinin ve hastalığın mevsimsel dağılımının belirlenmesi amaçlanmıştır. **Gereç ve Yöntem:** 1 Nisan 2014-31 Mayıs 2016 tarihleri arasında hastanemize başvuran ve pediatrik ve dermatolojik muayene ile EAAH tanısı alan hastalar; retrospektif olarak cinsiyet, yaş, tutulan bölgeler, eşlik eden semptomlar ve başvuru zamanı, fizik muayene bulguları açısından değerlendirildi. İstatistiksel analiz "SPSS for Windows 13" versiyonu ile verilerin deştriktif analizi yapılarak ortalama, minimum, maksimum ve standart sapma değerleri hesaplandı. **Bulgular:** Pediatri ve dermatoloji servislerinde 92 hastaya EAAH tanısı konuldu. Hastaların ortalama yaşı 5,08 (10 ay-16yaş) idi. 57 hasta erkek (%61,90), 35 hasta kız (%38,10) idi. En sık görülen semptomlar döküntü (%100) ve hafif ateş (%72,82) idi. Döküntü hastaların tamamında (%100) ellerde ve ayaklarda, %92,39'unda oral mukozada, %56,52'sinde gluteal bölgede görüldü. Hastalık en sık yaz ve sonbahar aylarında görüldü. **Tartışma:** EAAH özellikle 5 yaş altındaki çocukları etkileyen viral bir enfeksiyondur. Tanı için klinik bulgular yeterlidir ve şiddetli tutulumu olmayan olgularda semptomatik tedavi yeterlidir. Hastalık yaz aylarında çok sık görülmekteyken son zamanlarda mevsimsel deęişimlerle birlikte sonbahar aylarında da ikinci sıklıkta görülmeye başlanmıştır. Hastalara ve hasta yakınlarına özellikle bulaş yolları ve gerekli izolasyon yöntemleri anlatılması hala önemli yer tutmaktadır.

Anahtar Kelimeler

El-Ayak-Ağız Hastalığı; Mevsimsel Deęişim; Döküntü

Abstract

Aim: Hand-Foot-and-Mouth Disease (HFMD), which is caused by agents of the enterovirus family, leads to skin and mucosa lesions as well as non-complicated systemic infection. In the present review, we aimed to determine clinical characteristics and seasonal distribution of the patients diagnosed with HFMD. **Material and Method:** The patients referred and diagnosed with HFMD through dermatological and physical examinations between April, 1, 2014 and May, 31, 2016 were reviewed in terms of demographic data, complaints and physical findings. The statistical analysis was performed by "SPSS for Windows 13", descriptive analysis was performed, and minimum-maximum values and standard deviations were calculated. The Mann Whitney U test was used. Values of $p < 0.05$ were accepted as statistically significant. **Results:** Ninety two patients who were referred to top pediatrics and dermatology departments were diagnosed with HFMD. The mean age of the patients was 5.08 years (10 months-16 years). Fifty seven patients were male (61.90%), and 35 patients were female (38.10%). The most common symptoms at referral were rash (100%) and mild fever (72.82%). Rashes were found on the hands and feet (100% of patients), on the oral mucosa (92.39%), and in the gluteal region (56.52%). The disease appeared most commonly during summer and autumn. **Discussion:** Hand-Foot-and-Mouth Disease is a viral disease that appears most often in children of 5 years of age and younger. Clinical findings are sufficient for the diagnosis and symptomatic treatment is adequate for the cases without severe involvement. The disease is common during the summer but recently, due to seasonal variations, it has also become apparent during autumn, as well. It is important to inform the patients and their relatives about routes of transmission and the isolation methods required.

Keywords

Hand-Foot and Mouth Disease; Seasonal Variations; Rashes

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Corresponding Author: Alaaddin Yorulmaz, Çocuk Sağlığı ve Hastalıkları Bölümü, Konya Beyhekim Devlet Hastanesi, Konya, Turkey.

GSM: +905327806974 T.: +90 3322243060 F.: +90 3322631245 E-Mail: dralaaddin@myynet.com

Introduction

Exanthematous illnesses frequently seen in childhood area group of diseases which have a quite large and important place in the differential diagnosis of childhood disease. The existence of fever with rash increases the likelihood of an infectious diseases. Hand-Foot-and-Mouth Disease (HFMD) is an infection caused by viruses from the enterovirus family It appears with vesicular rash on the skin and mucosa and generally progresses without any complication [1]. Mild symptoms such as lethargy may accompany a mild fever. The disease is generally detected in children between 2 and 10 years of age [2]. The infection may be transmitted through the fecal-oral route, water resources (e.g., a swimming pool), body contact or respiratory tract secretions [3,4]. Small epidemics appear under temperate climate conditions, especially during the summer, the disease has a seasonal progress [5]. Although HFMD is a self-limiting disease with a generally good prognosis, in some cases serious clinical conditions may develop. The approach to the treatment of endemic uncomplicated disease is isolating patients to prevent spread of the disease and treating their symptoms. The present study was planned to draw attention to HFMD due to the increase in incidence of the disease in our country in

maximum values and standard deviations were calculated. The Mann Whitney U test was used. Values of $p < 0.05$ were accepted as statistically significant.

Results

The 92 patients included 57 (61.90%) boys and 35 (38.10%) girls, with an average age of 5.08 years (10 months-16 years). The most common symptoms were rash (100%) and subfebrile fever (72.82%). There was rash on the hands and feet in all patients, on the oral mucosa in 92.39%, in the gluteal area in 56.52%, and on the face in 7.60%. The average age of the 52 patients with rash in the gluteal area was 2.90, which is significantly lower than the average for those without gluteal rash (7.90 years) ($p < 0.05$). Furthermore, 41 of 52 patients with rash on the gluteal area were 3 years of age or younger (78.84%). Gastrointestinal symptoms such as nausea, vomiting, and diarrhea were observed in 13.04% of the patients. Demographic and clinical characteristics of these patients are summarized in Table 1. Age difference was not statistically significant. The disease was most common during summer (16 patients in July, 24 patients in August), and fall (14 patients in September, 17 patients in October) and gradually decreased during late fall.

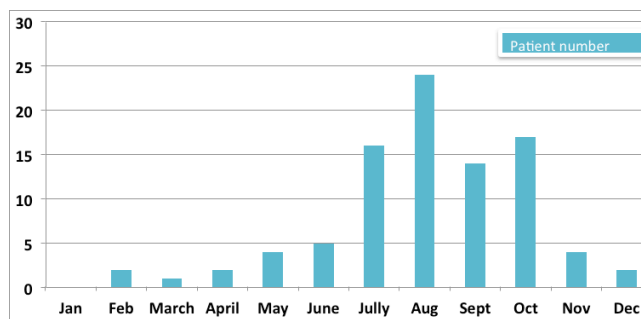
Tablo 1. Demographic and clinical characteristics of patients

Age Range	No	Gender		Mild Fever	Rash			GIS symptoms		
		Male	Female		Hand-foot	Oral Mucosa	Gluteal Region	Face	Diare	Vomitting
10 m- 1 year	3	2	1	2	3	2	3	1	1	0
Age 1-2	8	5	3	6	8	7	5	0	1	1
Age 2-3	22	14	8	17	22	21	12	2	4	2
Age 3-4	19	11	8	13	19	17	11	1	2	3
Age 4-5	6	4	2	4	6	6	3	0	1	0
Age 5-6	7	4	3	4	7	7	4	0	0	1
Age 6-7	2	1	1	2	2	2	1	0	0	0
Age 7-8	10	6	4	7	10	8	4	1	1	2
Age 10-16	15	10	5	12	15	13	9	2	2	3
Total (%)	92 (100)	57 (61,90)	35 (38,10)	67 (72,82)	92 (100)	85 (92,39)	52 (56,52)	7 (7,60)	12 (13,04)	12 (13,04)

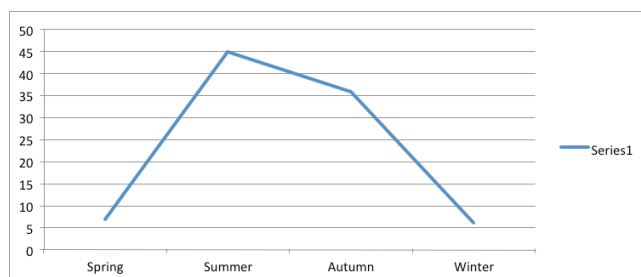
recent years. The aim of the present study was to review clinical and demographic characteristics of the patients diagnosed with HFMD and to research the seasonal distribution of the disease.

Material and Method

The medical files of 92 patients who were referred to the Pediatrics and Dermatology polyclinics of Beyhekim Public Hospital between April 1, 2014 and May 31, 2016 and diagnosed with HFMD were reviewed retrospectively. HFMD was diagnosed by detection of the symptoms and findings such as fever; macular, maculopapular, vesicular or petechial rash on the hands, feet, and gluteal area; herpangina; and pharyngitis. Ages and genders of the patients as well as period of referral (month-season), complaints at referral, physical examination findings, and laboratory analyses were recorded from the files. Patients who had Group A β -hemolytic streptococcus detected by throat swab culture were excluded. No viral markers were tested. The statistical analysis was performed by SPSS for Windows 13, descriptive analysis was performed, and minimum-minimum-



Grafik 1. The distribution of the number of patient by month.



Grafik 2. Seasonal distribution of the patients.

The disease was most common in August (24 patients) during summer and in October (17 patients) during fall. In other words, the disease was detected most often during the summer (44 patients) and fall (35 patients). The numbers of patients according to the months and seasons are shown in Graph 1 and Graph 2, respectively.

White blood counts of 11 (11.95%) patients who had whole blood count analysis were normal. Liver function tests were examined in only three cases (3.26%) and detected within normal range. Two patients (2.17%) were hospitalized and monitored due to severe mucositis, persistent fever, and nutritional problems.

Discussion

Hand-Foot-and-Mouth Disease is a contagious, enteroviral infection characterized by vesicular palmoplantar eruption in the hands and feet and erosive stomatitis. While the disease most frequently occurs with coxsackievirus A16, it also can be caused by coxsackievirus A5, A7, A9, B1, and B3 [6]. The second most common cause is enterovirus 71, which stands out because of its ability to cause epidemics associated with significant mortality and morbidity [6]. The majority of enterovirus infections have a good progress, with fever only, and appear as significant clinical syndromes such as hand-foot-and-mouth disease (HFMD), herpangina, and pleurodynia [6]. However, they also may cause life-threatening infections like meningitis, encephalitis, myocarditis, neonatal sepsis, and acute flaccid paralysis in rare cases.

The majority of HFMD patients are children between 2 and 10 years of age, especially children 5 years of age and younger [1]. The proportion of patients 5 years or younger has been found between 82.60% and 95.60% in different studies [7,8,9]. In the present study, patient ages ranged from 10 months to 16 years of age. The proportion of patients at 5.1 and below 5 years of age was 64.30%. HFMD is quite rare below 1 year of age due to conservation by transplacental antibodies [10,11]. In our study, only 3 patients were 10 months old and 39.13% of the patients were 3 years or younger. Kobayashi et al. has reported cases between 9 months and 9 years of age, with the majority of the cases (75%) during the first 3 years of age [12].

Mirand et al. observed in their study that HFMD was more common in male patients [13]. Similarly, Zhou et al. detected the ratio of boys to girls as 1.4 in their study [7]. Ekinci et al. reported in their study conducted in July 2012 that their 24 patients included 19 boys and 5 girls [14]. We also observed that number of the boys exceeded the number of the girls, with a ratio of 1.62.

HFMD has seasonal characteristics that are affected by changes in climate. High air temperature and humidity increases the incidence of HFMD. Mirand et al. showed that HFMD usually appeared between May and July (77%), peaked in June, and had a secondary acceleration between September and December [13]. A study conducted on the patients diagnosed with HFMD in China showed that the disease peaked in April/May and September/October [9]. Topkarcı et al. reported that the disease was most common in July and August, and secondarily most common in September and October [15]. In line with the literature, in our study HFMD was most common during summer and

secondarily most common during fall possible due to the effect of global warming.

The disease is quite communicable and transmitted through close contact with the patients via respiratory and droplet-transmitted infections and the fecal-oral route [1,2]. After an incubation period of 3 to 7 days, the disease progresses with aphthous ulcerovesicular lesions on the oral mucosa and vesicular rash surrounded by a red halo parallel to skin lines on the palm and sole [1,5]. Although the disease is called Hand-Foot-and-Mouth Disease, it may also appear on the knees, elbows, gluteal area, body, and, in rare cases, on the face, although none of these locations may be involved [1]. Rash usually disappears within 7-10 days. Subfebrile fever may also occur, with the rash generally appearing on the second day of the fever [1,2]. In the present study, rash on the hands and feet was detected in all of the patients (100%), while 72.82% had subfebrile fever. Topkarcı et al. reported rash in all patients and subfebrile fever in 76.20% of the patients in their study [15]. We detected oral mucosa involvement in 92.39% of the patients, gluteal area involvement in 56.52%, and vesicular rash in 7.60%.

A significant increase in gluteal area involvement has recently been observed. The average age of the patients with gluteal area involvement was 2.90, compared to 7.90 in those without gluteal area involvement. Involvement of the gluteal area was more common among the patients 3 years or younger who wear diapers.

Hand-Foot-and-Mouth Disease usually has a good progress. However, HFMD epidemics have increased in recent years and severe cases have been reported [7]. A supportive therapy is required for severe cases. In the present study, two male patients (10 and 12 months old) had to be hospitalized due to high fever. The white blood cell count of the two patients was normal in the whole blood count analysis. In the physical examination, the patient with oropharyngeal hyperemia had hyperemic aphthous lesions in patches on the soft palate, oropharyngeal region, and oral cavity mucosa; vesicular lesions appeared on the hands and feet. Both patients were admitted for four days and discharged without any complication. Rarely, the disease may cause fatal complications in the cases with immune system disorder. Findings such as high fever, vomiting, and confusion require examination for viral or aseptic meningitis and encephalitis. The disease may cause cardiac and pulmonary complications; therefore, ECG and radiological examinations such as chest x-ray should be performed [7]. We did not detect any patient with severe symptoms in the present study.

Infectiousness is higher during the first week of the disease. Virus carriage continues for a couple of weeks even after regression of the lesions. Li et al. have reported that viral excretion continued for 30 days in the throat swab and for 54 days in the stool after enterovirus 71 infection and that the lengths of such periods were consistent with the disease severity [16].

Conclusion

Hand-Foot-and-Mouth Disease is a viral disease that appears most often in children at 5 years of age and younger. It is usually observed during summer and fall. Clinical findings are sufficient for the diagnosis and symptomatic treatment is adequate for the cases without severe involvement. It should be consid-

ered that rash may not appear only on the hands, feet, and mouth, but also involve the gluteal area and face in younger age groups and severe cases. Usually HFMD ends without complications, but patients should be followed up in terms of cardiac and neurological involvement.

The infectiousness of HFMD is very high and protective precautions are important because there is not any exact treatment or vaccination. Hygiene of the hands; hygiene in food preparation and serving; hand cleaning of small children and their caregivers, particularly after toilet use; and early diagnosis isolation of children with suspicious clinical findings at school nursery or primary care health centers are important for preventing contamination and viral transmission. It is important to inform the patient and their relatives about routes of transmission and the isolation methods required.

Competing interests

The authors declare that they have no competing interests

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