Characterization of Cutaneous Findings in the Enterovirus Outbreak of 2011-2012

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Results

Table 1. Demographics (N=64)

<table>
<thead>
<tr>
<th>Location</th>
<th>Palmar/soles</th>
<th>Extremities</th>
<th>Face</th>
<th>Tongue</th>
<th>Buttocks, groin, perineum</th>
<th>Oropharyngeal erosions/ulcers</th>
<th>Nail Changes</th>
<th>Lesional morphology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range (mm)</td>
<td>51 (46-60)</td>
<td>60 (55-65)</td>
<td>52 (46-61)</td>
<td>35 (32-39)</td>
<td>45 (37-57)</td>
<td>28 (22-34)</td>
<td>7 (4-10)</td>
<td>Vesicles</td>
</tr>
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<td>45 (37-57)</td>
<td>28 (22-34)</td>
<td>7 (4-10)</td>
<td>Vesicles</td>
</tr>
<tr>
<td>Pre-existing skin condition (N=62)</td>
<td>Atopic dermatitis 37 (58%)</td>
<td>Subum 2 (5%)</td>
<td>Diaper dermatitis 2 (7%)</td>
<td>Seborrheic dermatitis 1 (3%)</td>
<td>Tinea pedis 1 (3%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Introduction

• Most outbreaks of hand, foot and mouth disease (HFMD) in North America are caused by Coxsackie A16.
• Beginning in November 2011, there were an increasing number of reports of atypical HFMD many of which were associated with Coxsackie A6 (CVA6), a virus uncommonly seen in the US.
• There have been international reports of CVA6 outbreaks in Finland, Taiwan, Japan and Singapore starting as early as 2008.
• The rash associated with CVA6 has been described as “more severe,” but has not been well characterized.
• Our aim was to characterize the cutaneous findings of this exanthem that diverge from typical HFMD.

Methods

Study Design
• Multi-institutional, retrospective, case series of a convenience sample of patients evaluated by pediatric dermatologists with atypical presentations of HFMD.

Inclusion Criteria
• Viral confirmation of CVA6 or met the clinical case criteria (see below).

Exclusion Criteria
• Presentation could be explained by another named illness
• Presentation consistent with classic HFMD with <5% body surface area (BSA) involvement.

Clinical Case Criteria
• Definite case: CVA6 confirmed via rTPCR in oropharynx, skin, blood, or stool
• Probable case: At least 1 criterion from group 1, and at least 1 from group 2

Group 1 (Features suggestive of HFMD)
• Enterovirus rPCR positive
• Enanthem characteristic of coxsackie infection
• Enanthem with vesicles classic for Coxsackie infection
• History of exposure to HFMD 2-14 days prior to disease onset

Group 2 (Unusual Morphology or Extent)
• Enanthem more extensive than classic HFMD (>5% BSA)
• Erosions, vesicles and bullae with acrofacial accentuation
• Purpuric/peletchial/hamorrhagic lesions
• Gianotti-Crosti-like eruption
• Large bullae

Viral Testing
When ordered by the clinician, enterovirus typing was performed using rPCR by the Centers for Disease Control or the California Department of Public Health.

Statistical Analysis
• Data was collected and analyzed using Excel

Results

Table 2. Cutaneous features: location and morphology [% positive/# reported (%)].

<table>
<thead>
<tr>
<th>Lesional morphology</th>
<th>Vesicles</th>
<th>Bullae</th>
<th>Erosions</th>
<th>Papules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range (mm)</td>
<td>55 (40-60)</td>
<td>64 (57-68)</td>
<td>59 (54-64)</td>
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<tr>
<td>Other loci minor</td>
<td>13 (22%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gianotti-Crosti-like</td>
<td>21 (35%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hemorrhagic/peletchial</td>
<td>11 (18%)</td>
<td></td>
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</table>

Table 3. Clinical features [% positive/# reported (%)].

<table>
<thead>
<tr>
<th>Location</th>
<th>Fever</th>
<th>Sore throat/mouth</th>
<th>Vomiting</th>
<th>Diarrhea</th>
<th>Cough</th>
<th>Dehydration</th>
<th>Headache</th>
<th>Breathing</th>
<th>Stiff neck</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range (mm)</td>
<td>42 (66%)</td>
<td>21 (33%)</td>
<td>5/5 (9%)</td>
<td>6/2 (30%)</td>
<td>8/5 (16%)</td>
<td>5/6 (83%)</td>
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</tr>
<tr>
<td>Other</td>
<td>9 (14%)</td>
<td>19 (29%)</td>
<td>7/6 (12%)</td>
<td>9/8 (10%)</td>
<td>7/5 (14%)</td>
<td>2/2 (100%)</td>
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Conclusions

• The exanthem associated with the enterovirus outbreak of 2011-2012 has an atypical presentation that in many cases has been proven to be due to a unique serotype, CVA6.
• The atypical features of this outbreak are:
  • Large BSA involvement – the majority >10% BSA.
  • Frequent “eczema herpeticum,” i.e. eczema herpeticum like presentation
  • Accentuation in areas of skin injury or irritation (les cerc case contro)
  • Prominent facial involvement
  • Less oropharyngeal involvement than classic HFMD
  • Osteomyelitis has been reported to be a common feature following CVA6 infection, but we could not fully assess nail changes because of short follow-up time.
• Associated systemic symptoms do not appear to be more severe than in typical HFMD.
• Clinicians should be aware of this atypical presentation that mimics vasculitis, eczema herpeticum, and primary bullous disorders to avoid misdiagnosis and unnecessary interventions.
• Enterovirus PCR of skin, oropharynx, perirectum, or blood can be diagnostic. Viral culture is not recommended as CVA6 does not grow well in culture.

References

1. Centers for Disease Control and Prevention (CDC). Notes from the field: severe hand, foot, and mouth disease associated with coxsackievirus a6 – Alabama, Connecticut, California, and New York, November 2011. February 2012. MMWR Morb Mortal Wkly Rep 2012; Mar 16;61(10):92-

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