J. Amir, M. Nussinovitch, R. Kleper, H. A. Cohen, I. Varsano
Primary Herpes Simplex Virus Type 1 Gingivostomatitis in Pediatric Personnel

Summary: Herpetic gingivostomatitis is common in young children, but primary oral infection has also been described in adults. Herpetic whitlow as an occupational hazard of medical personnel has been well documented. Four cases of primary herpetic gingivostomatitis are reported in two pediatricians and two pediatric nurses who contracted the infection in their fourth decade of life. All suffered from sore throat and fever as presenting symptoms. Correct diagnosis was delayed for 4–5 days. In conclusion, pediatric personnel with pharyngitis and a negative history of herpetic gingivostomatitis or herpes labialis should bear the possibility of oral HSV infection in mind. Early diagnosis is essential to prevent the spread of the infection to their patients.

Introduction
Herpetic gingivostomatitis is the most common clinical manifestation of primary herpes simplex virus (HSV) infection in young children. Primary oral infection has also been described in adults as stomatitis and posterior pharyngitis [1] or gingivostomatitis [2].

The transmission of herpetic whitlow, an HSV infection of a digit from infected patients to medical staff, has been well documented [3, 5]. The known risk group includes dentists, anesthesiologists and intensive care unit (ICU) physicians and nurses. Primary HSV infection of the face, however, is rarely acquired by physicians and only one such case has been reported after mouth-to-mouth resuscitation [6].

We report four cases of primary herpetic gingivostomatitis in two pediatricians and two pediatric nurses, another occupational group recently recognized to be at risk of contracting HSV.

Materials and Methods
Herpes simplex viral culture: A specimen was collected from each patient using a dacron-tipped swab which was gently rubbed over the oral lesion. The swabs were placed into 2 ml of transport media and sent over ice to the laboratory. The HSV were isolated as described previously [7]. Serotyping of HSV with monoclonal antibodies – all isolates of HSV were typed by fluorescence conjugate monoclonal antibodies (Seyva Microtok HSV-1, HSV-2, Palo Alto, CA), according to the manufacturer’s instructions [7].

Serology assay: an indirect immunofluorescence antibody (IFA) was performed as described previously [8]. Rapid enzyme immunoassay for the detection of HSV antigen: the HSV antigen was detected by SureCell™ (Kodak Rochester, NY) as described previously [9].

Case Reports
A summary of the demographic and clinical findings for the four pediatric personnel with gingivostomatitis caused by HSV type 1 is presented in Table 1.

Case 1: A previously healthy 39-year-old male pediatrician complained of a sore throat and fever of up to 40.5 °C. On day 3 of the illness, he noted by self-examination, an enlarged cervical lymphadenopathy and redness of the pharynx without exudate; treatment with penicillin-V 500 mg every 8 h was initiated. On day 5, owing to the continuation of the high fever, severe difficulties in eating and drinking and the onset of a vesicular rash on the face, he requested a second opinion. On examination, axillary temperature was 39.5 °C; a vesicular rash was noted on the chin, cheeks and lips and ulcerating vesicles were seen on the oral mucosa and pharynx. The gums were swollen and tender. The anterior cervical lymph nodes were enlarged (3 × 3 cm) and tender. Initial white blood cell count was 15,000/mm³ with 75% neutrophils and 20% lymphocytes. Herpes simplex virus antigen was detected from the oral lesion by the rapid enzyme immunoassay and HSV type 1 was isolated on routine viral culture. Penicillin was discontinued and treatment with acyclovir 200 mg every 4–5 h was started. The fever gradually disappeared over 3 days and the oral lesions resolved within 7 days. Serum IgM and IgG for HSV were 1:8 and 1:4, respectively, on day 5 of the fever and rose to 1:128 and 1:256 4 weeks later.

Case 2: A 36-year-old female pediatrician complained of a sore throat which progressed within 24 h to a spiked fever accompanied by chills and malaise. Treatment with amoxicillin 500 mg every 8 h was started. The fever persisted, however, for the next 3 days accompanied by the development of swollen gums which caused difficulties in eating solid food. On the fourth day of the illness, ulceration vesicles were noted on the lips. She was examined by a university physician (JA) the following day. Physical examination showed mild dehydration. The gums were swollen and tender and bled easily and a few ulcerating vesicles were noted on the oral mucosa and the tonsils. The cervical lymph nodes were mildly enlarged but extremely tender. Direct HSV antigen detection from the oral lesion was positive and isolation of the HSV type 1 was confirmed on tissue culture. Treatment with oral acyclovir 1,000 mg/day was initiated. Temperature returned to normal within 36 h. The oral lesion, gingivostomatitis and malaise resolved gradually over the next 8 days. Serum IgG titers for HSV were 1:2 and > 1:64 on days 5 and 14, respectively.

Table 1: Summary of the demographic and clinical findings for the four pediatric personnel with gingivostomatitis caused by HSV type 1

<table>
<thead>
<tr>
<th>Case</th>
<th>Patient</th>
<th>Age</th>
<th>Sex</th>
<th>History</th>
<th>Symptoms</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Male</td>
<td>39</td>
<td>M</td>
<td>Healthy</td>
<td>Sore throat, fever, enlarged cervical lymphadenopathy</td>
<td>HSV type 1</td>
</tr>
<tr>
<td>2</td>
<td>Female</td>
<td>36</td>
<td>F</td>
<td>Healthy</td>
<td>Sore throat, fever, swelling of gums</td>
<td>HSV type 1</td>
</tr>
</tbody>
</table>

Received: 17 March 1997/Revision accepted: 9 June 1997
Table 1: Demographic and clinical characteristics of pediatric personnel with herpetic gingivostomatitis.

<table>
<thead>
<tr>
<th>Case</th>
<th>Age (yrs.)</th>
<th>Sex</th>
<th>Presenting symptoms</th>
<th>Delay in diagnosis (days)</th>
<th>Known contact with HSV</th>
<th>Duration of illness (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>39</td>
<td>Male</td>
<td>Sore throat, fever</td>
<td>5</td>
<td>No</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>36</td>
<td>Female</td>
<td>Sore throat</td>
<td>5</td>
<td>No</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>32</td>
<td>Female</td>
<td>Sore throat, fever, eating difficulties</td>
<td>4</td>
<td>Yes</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>34</td>
<td>Female</td>
<td>Sore throat, painful lip lesions</td>
<td>12</td>
<td>No</td>
<td>14</td>
</tr>
</tbody>
</table>

Case 3: A 32-year-old nurse working in a well-baby public clinic complained of a sore throat, fever, and difficulties in eating and drinking 4 days prior to her medical visit. Her 3-year-old daughter was being followed in the pediatric day care unit because she had been suffering from herpetic gingivostomatitis for 8 days, which was confirmed by tissue culture as HSV type 1. The nurse was in the 34th week of her second pregnancy. Upon examination, ulcerating vesicles were seen on the oral mucosa, tongue and pharynx. She was sent to the delivery room where she was admitted for intravenous rehydration. HSV type 1 was isolated from her oral lesion. A healthy full-term baby was born 4 weeks later with no clinical signs or symptoms of HSV infection.

Case 4: A 34-year-old nurse working in the Department of Pediatric Surgery complained of a sore throat and painful vesicular lesions on her lips. On the fourth day of her illness, treatment with augmentin 500 mg every 8 h was initiated. On the following day, she developed a low-grade fever, lesions on her tongue and swollen gums. On the 12th day of her illness, she was seen in the Pediatric Ambulatory Unit with her 2-year-old daughter who had developed gingivostomatitis. Physical examination of the mother revealed healing lesions on the lips and oral mucosa. Serum IgM for HSV was 1:128 and IgG > 1:1024 and HSV type 1 was isolated from her daughter’s oral lesions.

Discussion

The occurrence of four cases of primary HSV gingivostomatitis in pediatric physicians and nurse practicing for more than 8 years appears to be more than a mere coincidence. The four cases were diagnosed within a 20-month period. The first physician works in both a general pediatric department and an outpatient clinic in the evenings, while the other works only in a primary care clinic. Neither recalled having had any HSV infection, such as gingivostomatitis or herpes labialis in the past, or contact with affected patients or households within 3 weeks prior to their illness. The nurses also could not recall any episode of herpes labialis in the past.

Herpetic whitlow is a recognized occupational hazard of dental personnel who may acquire the infection from patients’ secretions [10], but an outbreak of HSV type 1 gingivostomatitis in 20 adults treated by dental hygienists with whitlow has also been reported [11]. HSV type 1 has been documented in pediatric intensive care unit nurses [12]: three nurses acquired herpetic whitlow and one of their husbands developed gingivostomatitis; a fourth had herpetic tonsillo-pharyngitis. Primary herpetic infection of the face after mouth-to-mouth resuscitation of a patient with HSV lesions on the tongue, trachea and esophagus has also been reported [6]. All these occupational occurrences point to a direct inoculation of HSV from the oral secretion of infected patients to the skin or mucosa of the health-care providers as probably presented by the case of the nurse.

In the present cases of the pediatricians, however, the route of infection is unclear, although we assume that infected secretion of children was the source, either directly by droplets or via autoinoculation by the physician’s unwashed hands. The negative history of contact with children with gingivostomatitis is not surprising, as Cesario et al. [13] found that HSV shedding occurred without symptoms in nearly two-thirds of the children studied. Outbreaks of herpetic gingivostomatitis in hospitalized young children have been described in the past [14]. The children’s nurses with herpes labialis were the source of infection; therefore, pediatric personnel with primary or secondary HSV type 1 infection should not be in contact with young children as long as viral shedding persists. There are no data relating to the prevention of HSV spreading by a face mask.

The nurse presented here was in her third trimester of pregnancy. Although most neonatal HSV infections result from the retrograde spread of HSV type 2, secondary to maternal genital infection or via the passage of the infant through an infected maternal genital tract, primary infection with HSV type 1 during pregnancy may theoretically also affect the fetus after maternal viremia. Limited data are available on the use of acyclovir during pregnancy. Routine treatment of HSV infection in pregnant women is therefore not recommended. Careful follow-up of infants born to mothers with primary HSV infection during pregnancy is needed for early recognition of congenital HSV infection.

Herpes simplex virus does not infect by direct inoculation those who have herpes antibody [4]. It is surprising that the presented cases were seronegative in their fourth decade in spite of massive exposure to children for many years. We assume that more adults are seronegative as the rate of acquisition of HSV infection in childhood is declining.

In all four cases, the course of the illness was quite severe with a delayed diagnosis. Earlier recognition of HSV ginv-