Localized Melioidosis in Children in Thailand: Treatment and Long-term Outcome

by Pagakrong Lumbiganon,1 Napaporn Chotechuangnirun,2 Pope Kosalaraksa,1 and Jamaree Teeratakulpisarn1

1Department of Pediatrics, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand
2Department of Pediatrics, Kalasin Hospital, Kalasin, Thailand

Correspondence: Pagakrong Lumbiganon, Department of Pediatrics, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand, 40002. Tel/Fax: 66-43-348382. E-mail: <paglam@kku.ac.th>

Summary

Melioidosis, an infection caused by Burkholderia pseudomallei, can present as severe septicemia or localized infection. Data on optimum antibiotic treatment regimen for localized melioidosis in children is limited. This is a report on localized melioidosis in children, regarding clinical presentation, treatment and the long-term outcomes. We reviewed 37 cases of localized melioidosis in children treated between 1994 and 2006 and followed up them prospectively until 1 October 2007. The two most common presentations were skin/soft tissue infections and suppurative parotitis. Oral eradication antibiotics after initial parenteral therapy included trimethoprim–sulfamethoxazole (10 patients) and trimethoprim–sulfamethoxazole in combination with doxycycline (four patients). Patients who did not get any parenteral antibiotics for B. pseudomallei were treated with oral trimethoprim–sulfamethoxazole (10 patients) and trimethoprim–sulfamethoxazole in combination with doxycycline (one patient). No adverse effects were reported. We were able to follow-up 32 patients, all recovered except one patient reported a history of possible relapse.

Key words: Melioidosis, Burkholderia pseudomallei, children, treatment, outcome, Thailand.

Introduction

Melioidosis is an infection caused by Burkholderia pseudomallei, an organism found in the soil and water of Southeast Asia and northern Australia [1, 2]. The clinical manifestation is highly variable and ranges from acute, rapidly progressive septicemia and septic shock with widespread bacterial dissemination to a localized infection characterized by an insidious onset of infection in any organ of the body without bacteremia or septicemia [3]. Melioidosis occurs predominantly in adults. Children account for 4–17% of the total cases in most series [4, 5], therefore there is no evidence-based recommendations for the treatment of this infection in children. Treatment of septicemia or severe localized melioidosis in children is based on the studies in adults, which includes intravenous ceftazidime for 10–14 days, followed by an oral eradication therapy with trimethoprim–sulfamethoxazole alone or in combination with doxycycline (only in children ≥8 years of age) with the total duration of 20 weeks due to the high relapse rate in adult studies [6–10]. For the treatment of mild localized infection, children can be treated with only oral trimethoprim–sulfamethoxazole with a shorter duration and good outcome [11–13]. There is also a recommendation for the use of amoxicillin–clavulanic acid as the oral drug of choice in children instead of trimethoprim–sulfamethoxazole [2, 14].
Localized melioidosis is the most common form of melioidosis in children, it accounts for two-thirds of all reported cases in children [15, 16], but data on the treatment and long-term outcome are very limited [11–14]. This is a report on localized melioidosis in children treated at two hospitals in Northeast Thailand regarding the clinical presentation, treatment and long-term outcome.

Patients and Methods

Srinagarind Hospital is a tertiary university hospital in Khon Kaen province. Kalasin Hospital is a provincial hospital situated ~70 km to the east of Khon Kaen. Both hospitals are located in the northern half of Northeast Thailand where melioidosis is endemic.

We retrospectively reviewed cases of localized melioidosis in patients between the ages of 1 month and 15 years treated at the two hospitals between January 1994 and December 2006, then followed up them prospectively until 1 October 2007. Some patients’ data has been previously reported [11]. All of the patients had *B. pseudomallei* grew from various clinical specimens but had negative blood culture or did not have blood culture taken due to lack of severe systemic symptoms. The microbiologic procedures for the identification of *B. pseudomallei* are as described elsewhere [17]. Susceptibility testing was performed using the standard disk diffusion method [18].

The demographic data, clinical presentations and treatments were recorded, including the types of antibiotics and the duration of therapy. The patients were followed up at the outpatient clinic of each hospital as per the clinical responses, clinical relapse or signs and symptoms of drug toxicity especially skin rashs. In patients who were treated with trimethoprim–sulfamethoxazole, the complete blood counts were performed at the follow-up visits to evaluate for any hematologic adverse effect. Patients were also followed up by confidential mail to ask about their well-being and any signs of recurrence. The duration of follow-up was calculated from the follow-up time of patients whose clinical outcome could be ascertained either by outpatient visit or mail follow-up for a duration of at least 2 months after treatment initiation.

The study was approved by the Ethics Committee of Khon Kaen University and of the Ministry of Public Health, Thailand.

Results

Between January 1994 and December 2006, 37 cases of localized melioidosis in children were seen. The patients ranged in age between 1 and 14.8 years (mean 6.8). Twenty-three (62.2%) patients were boys. Twenty-five (67.6%) were seen during the rainy season (i.e. between June and October). The two most common presentations were skin and soft tissue infections (14 patients) and unilateral suppurrative parotitis (11 patients) (Table 1). Three (8.1%) patients had underlying immunocompromised conditions: (i) idiopathic thrombocytopenic purpura; (ii) juvenile rheumatoid arthritis (both i and ii were treated with corticosteroid); and (iii) chronic renal failure.

The respective clinical presentations, treatments and outcomes of patients whose oral antibiotic regimens were trimethoprim–sulfamethoxazole alone or trimethoprim–sulfamethoxazole in combination with doxycycline are presented in Tables 2 and 3, respectively, while the patients treated with other oral antibiotic regimens are presented in Table 4. The usual dose of antibiotics were ceftazidime: 100–120 mg kg$^{-1}$ day$^{-1}$ in three to four divided doses, trimethoprim–sulfamethoxazole: 8–10 mg of trimethoprim, 40–50 mg of sulfamethoxazole kg$^{-1}$ day$^{-1}$ in two divided doses for both intravenous and oral administration and oral doxycycline: 2.2–4 mg kg$^{-1}$ day$^{-1}$ in two divided doses, maximum 100 mg twice a day (only for children ≥8 years of age). All of the isolates of *B. pseudomallei* were susceptible to ceftazidime and doxycycline, whereas only 25 isolates were tested against trimethoprim–sulfamethoxazole and 23 (92%) isolates were susceptible.

Treatment consisted of incision and drainage in every patient with accessible abscesses. Patients with severe systemic symptoms or those who had multiple sites involvement were treated initially with parenteral antibiotics that included intravenous ceftazidime in combination with intravenous trimethoprim–sulfamethoxazole (eight patients), ceftazidime alone (five patients), trimethoprim–sulfamethoxazole (five patients), ceftazidime in combination with intravenous trimethoprim–sulfamethoxazole and chloramphenicol (one patient) and chloramphenicol alone (one patient). After fever and other severe symptoms had subsided, oral antibiotics including trimethoprim–sulfamethoxazole (10 patients),

<table>
<thead>
<tr>
<th>Type of infection</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin and soft tissue infection</td>
<td>10</td>
<td>4</td>
<td>14</td>
<td>37.8</td>
</tr>
<tr>
<td>Parotitis</td>
<td>7</td>
<td>4</td>
<td>11</td>
<td>29.7</td>
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<td>Lymphadenitis</td>
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<td>1</td>
<td>4</td>
<td>10.8</td>
</tr>
<tr>
<td>Other*</td>
<td>4</td>
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<td>8</td>
<td>21.6</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>13</td>
<td>37</td>
<td>100</td>
</tr>
</tbody>
</table>

*Pharyngitis and lymphadenitis two cases, pneumonia two cases, pneumonia with pleural effusion one case, osteomyelitis one case, infected thyroglossal duct cyst one case, urinary tract infection one case.

<table>
<thead>
<tr>
<th>Sites of infection and sex of the 37 children with localized melioidosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of infection</td>
</tr>
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<td>-------------------</td>
</tr>
<tr>
<td>Skin and soft tissue infection</td>
</tr>
<tr>
<td>Parotitis</td>
</tr>
<tr>
<td>Lymphadenitis</td>
</tr>
<tr>
<td>Other*</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

*Pharyngitis and lymphadenitis two cases, pneumonia two cases, pneumonia with pleural effusion one case, osteomyelitis one case, infected thyroglossal duct cyst one case, urinary tract infection one case.
<table>
<thead>
<tr>
<th>No</th>
<th>Age (year)</th>
<th>Sex</th>
<th>Month and year of presentation</th>
<th>Duration of illness</th>
<th>Site of infection</th>
<th>Antibiotic treatment</th>
<th>Duration of follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Age (year)</td>
<td>Sex</td>
<td>Month and year of presentation</td>
<td>Duration of illness</td>
<td>Site of infection</td>
<td>Parenteral</td>
<td>Oral</td>
</tr>
<tr>
<td>1</td>
<td>5, M</td>
<td>15 days</td>
<td>Suppurative parotitis, Lt</td>
<td>CTZ + TM/SM 3 weeks</td>
<td>TM/SM 11 weeks</td>
<td>1 year 3 months</td>
<td>4 years 10 months</td>
</tr>
<tr>
<td>2</td>
<td>3, F</td>
<td>21 days</td>
<td>Suppurative parotitis, Lt</td>
<td>CTZ 4 days + TM/SM 12 days</td>
<td>TM/SM 5 weeks</td>
<td>–</td>
<td>2 years 10 months</td>
</tr>
<tr>
<td>3</td>
<td>1, M</td>
<td>2 weeks</td>
<td>Pneumonia with pleural effusion</td>
<td>CTZ + TM/SM 2 weeks</td>
<td>TM/SM 14 weeks</td>
<td>1 month</td>
<td>4 years 1 month</td>
</tr>
<tr>
<td>4</td>
<td>1, M</td>
<td>2 months</td>
<td>Abscess at right leg, knee, spleen</td>
<td>CTZ + TM/SM 3 weeks</td>
<td>TM/SM 7 weeks</td>
<td>6 weeks</td>
<td>4 years 10 months</td>
</tr>
<tr>
<td>5</td>
<td>5, F (ITP)</td>
<td>7 days</td>
<td>Abscesses at right groin, both legs, arm, back</td>
<td>CTZ + TM/SM 4 weeks</td>
<td>TM/SM 20 weeks</td>
<td>1 year 11 months</td>
<td>–</td>
</tr>
<tr>
<td>6</td>
<td>3, M</td>
<td>14 days</td>
<td>Abscess at trunk</td>
<td>CTZ 3 weeks</td>
<td>TM/SM 10 weeks</td>
<td>–</td>
<td>4 years 9 months</td>
</tr>
<tr>
<td>7</td>
<td>14, M</td>
<td>1 month</td>
<td>Open fracture both bones with osteomyelitis at Rt forearm, pneumonia (car accident)</td>
<td>CTZ then TM/SM + cefoperasone/sulbactam 3 weeks</td>
<td>TM/SM 21 weeks</td>
<td>2 months</td>
<td>–</td>
</tr>
<tr>
<td>8</td>
<td>5, M</td>
<td>2 months</td>
<td>Abscesses at both lower legs, right thigh</td>
<td>TM/SM 1 week</td>
<td>TM/SM 7 weeks</td>
<td>1 year 5 months</td>
<td>7 years 6 months</td>
</tr>
<tr>
<td>9</td>
<td>5, M</td>
<td>2 months</td>
<td>Infected thyroglossal duct cyst</td>
<td>TM/SM 3 days</td>
<td>TM/SM 6 weeks</td>
<td>11 months</td>
<td>4 years 1 month</td>
</tr>
<tr>
<td>10</td>
<td>3, M</td>
<td>10 days</td>
<td>Suppurative parotitis, Lt</td>
<td>TM/SM 2 weeks</td>
<td>TM/SM 6 weeks</td>
<td>3 weeks</td>
<td>2 years 2 months</td>
</tr>
<tr>
<td>11</td>
<td>11, F</td>
<td>21 days</td>
<td>Suppurative parotitis, Lt</td>
<td>–</td>
<td>TM/SM 6 weeks</td>
<td>–</td>
<td>5 years 1 month</td>
</tr>
<tr>
<td>12</td>
<td>7, M</td>
<td>14 days</td>
<td>Suppurative parotitis, Lt</td>
<td>–</td>
<td>TM/SM 2 weeks</td>
<td>–</td>
<td>2 years</td>
</tr>
<tr>
<td>13</td>
<td>5, F</td>
<td>6 months</td>
<td>Abscess at Lt arm</td>
<td>–</td>
<td>TM/SM 8 weeks</td>
<td>2 months</td>
<td>6 years 3 months</td>
</tr>
<tr>
<td>14</td>
<td>1, M</td>
<td>1 month</td>
<td>Abscess at scalp (glass cut wound)</td>
<td>–</td>
<td>TM/SM 1 week</td>
<td>–</td>
<td>6 years 1 month</td>
</tr>
<tr>
<td>15</td>
<td>8, M</td>
<td>3 weeks</td>
<td>Abscess at scalp (fall)</td>
<td>–</td>
<td>TM/SM 4 weeks</td>
<td>–</td>
<td>5 years 9 months</td>
</tr>
<tr>
<td>16</td>
<td>3, M</td>
<td>1 month</td>
<td>Abscess at Rt arm (fall)</td>
<td>–</td>
<td>TM/SM 2 weeks</td>
<td>–</td>
<td>4 years 10 months</td>
</tr>
<tr>
<td>17</td>
<td>6, F</td>
<td>3 months</td>
<td>Abscess at axilla</td>
<td>–</td>
<td>TM/SM 6 weeks</td>
<td>2 weeks</td>
<td>4 years 8 months</td>
</tr>
<tr>
<td>18</td>
<td>10, M</td>
<td>17 days</td>
<td>Lt cervical lymphadenitis</td>
<td>–</td>
<td>TM/SM 1 week</td>
<td>–</td>
<td>8 years</td>
</tr>
<tr>
<td>19</td>
<td>2, F</td>
<td>3 weeks</td>
<td>Rt cervical lymphadenitis</td>
<td>–</td>
<td>TM/SM 2 weeks</td>
<td>1 week</td>
<td>Lost</td>
</tr>
<tr>
<td>20</td>
<td>4, M</td>
<td>3 weeks</td>
<td>Lt posterior auricular lymphadenitis</td>
<td>–</td>
<td>TM/SM 4 weeks</td>
<td>2 months</td>
<td>3 years 9 months</td>
</tr>
</tbody>
</table>

*a* Underlying condition.

*b* History of trauma.

*c* With pustules at shoulder, arm, leg and ultrasonographic finding of splenic abscess.

CTZ, ceftazidime; TM/SM, trimethoprim–sulfamethoxazole; ITP = idiopathic thrombocytopenic purpura.
trimethoprim–sulfamethoxazole in combination with doxycycline (four patients), doxycycline alone (two patients), amoxicillin–clavulanic acid (one patient) and trimethoprim–sulfamethoxazole with chloramphenicol (one patient) were administered for varying durations depending on the severity of the infection.

Two patients had possible drug allergies: (i) The first, a 13-year-old boy, (Patient 1, Table 3) developed urticarial rashes after receiving ceftazidime for 14 days so the drug was switched to imipenem for parenteral therapy. He was given trimethoprim–sulfamethoxazole as oral eradication therapy, of which he developed maculopapular rashes after 5 days of treatment so it was changed to doxycycline (for 14 weeks). (ii) The second was an 8-year-old boy (Patient 2, Table 4) with suppurative parotitis who developed maculaopapular rashes while receiving ceftazidime and trimethoprim–sulfamethoxazole. The rashes subsided after discontinuation of the trimethoprim–sulfamethoxazole, after which he was treated successfully with 2 weeks of ceftazidime without oral eradication antibiotic.

Five patients who took long-term oral trimethoprim–sulfamethoxazole had complete blood counts performed at follow-up visits at 7–28 days after the first tests (median, 21 days). Neither anemia nor neutropenia was found. One patient (Patient 3, Table 4) went to another hospital and the information on him was unavailable.

Seventeen patients did not get any parenteral antibiotics specifically for B. pseudomallei. Most of them were initially treated with either intravenous cloxacillin, cefotaxime or oral cloxacinil. After the culture results were available, the drugs were switched to oral antibiotics for treatment of melioidosis. The oral antibiotic regimens included: (i) trimethoprim–sulfamethoxazole (10 patients) and (ii) trimethoprim–sulfamethoxazole with doxycycline (one patient). Two patients were treated with oral amoxicillin–clavulanic acid, one of whom (Patient 7, Table 4) had persisting evidence of abscess formation despite the incision and drainage and 1 week of oral amoxycillin/clavulanic acid. This patient refused to be admitted to hospital for re-drainage and was lost to follow-up. Four patients were treated with other antibiotics not active against B. pseudomallei including cloxacinil (three patients) and amoxicillin (one patient).

The outcome of treatment could be ascertained in 32 patients, all of whom recovered from their acute illnesses. The median duration of the follow-up was 4 years (range, 2 months–8.3 years). There was a single report of relapse (1 out of 32, 3%): a 5-year-old boy with suppurative parotitis, pustular lesions on the skin and ultrasonographic evidence of splenic abscess. He received trimethoprim–sulfamethoxazole as oral eradication therapy (Table 2, Patient 1). His parents reported an episode of skin infection in his ankle 2 years after the first illness. The infection was successfully treated at a local hospital by surgical drainage of the abscess and oral medication. It is not known whether any culture was performed.

Discussion

In this study, the two most common presentations of localized melioidosis in children at our hospitals were skin/soft tissue infections and suppurative parotitis. Only three patients (8%) had an underlying immuno-compromised condition. Among 32 patients who could be followed up at a duration of at least 2 months after treatment or longer, all recovered from their acute illness, with one case of possible relapse (3%).

Our study demonstrates that the outcome of localized melioidosis in children is usually good and relapse is uncommon, which is consistent with other studies [12–14]. In Australia, the first-line therapy for eradication of B. pseudomallei after the initial intravenous antibiotic is trimethoprim–sulfamethoxazole and the recommended dose is 16 mg of trimethoprim, 80 mg of sulfamethoxazole per kg per day, given in two divided doses [1, 5], which is much higher than the daily dose used in Thailand [9]. A report from the Northern Territory of Australia describing nine cases of pediatric melioidosis, five of which were treated with oral trimethoprim–sulfamethoxazole (as an eradication antibiotic regimen after intravenous antibiotic therapy in four cases and as the only oral antibiotic in one case) with complete recovery and no serious side-effect reported [12]. Drug allergy and other side-effects of trimethoprim–sulfamethoxazole were also not common in our pediatric population.

In Sappasitprasong Hospital, Ubon Ratchathani, a province in the southern half of northeast Thailand, amoxicillin–clavulanic acid is used for the eradication treatment of melioidosis in children with good outcome [14, 19] and it is recommended as an oral antibiotic of choice for children and pregnant women [2]. A study in adult patients found that oral eradication-phase treatment with amoxicillin–clavulanic acid was associated with higher relapse rates compared to trimethoprim–sulfamethoxazole-based regimens [20]. Based on the pharmacokinetic study in patients with melioidosis and the expert consensus guidelines [21, 22], amoxicillin–clavulanic acid of 20/5 mg kg$^{-1}$ needs to be used at least three times a day which will deter children’s compliance. However, due to the limitation of available oral antibiotics for melioidosis and the uncommon relapse in children, we use amoxicillin–clavulanic acid as a second-line regimen in patients intolerant to trimethoprim–sulfamethoxazole.

Our data support the contention that trimethoprim–sulfamethoxazole can be used for
TABLE 3

Age, sex, month and year of presentation, duration of illness, treatment and duration of follow-up of pediatric patients whose oral antibiotics were trimethoprim–sulfamethoxazole plus doxycycline

<table>
<thead>
<tr>
<th>No</th>
<th>Age (years), Sex</th>
<th>Month and year of presentation</th>
<th>Duration of illness</th>
<th>Site of infection</th>
<th>Antibiotic for melioidosis</th>
<th>Duration of follow-up</th>
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<tr>
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<td></td>
<td>Parenteral</td>
<td>Oral</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TM/SM + DX</td>
<td>Parenteral</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TM/SM</td>
<td>TM/SM + DX</td>
</tr>
<tr>
<td>1</td>
<td>13, M</td>
<td>8/2003</td>
<td>1 month</td>
<td>Pharyngitis, Lt cervical lymphadenitis, liver abscess</td>
<td>CTZ 14 days then Imipenem 9 days</td>
<td>2 years 1 month</td>
</tr>
<tr>
<td>2</td>
<td>5, M (JRA)</td>
<td>9/2000</td>
<td>14 days</td>
<td>Abscesses at axilla, scalp, shoulder</td>
<td>CTZ + TM/SM 3 weeks</td>
<td>6 years 9 months</td>
</tr>
<tr>
<td>3</td>
<td>8, M</td>
<td>3/2004</td>
<td>1 month</td>
<td>Abscess at forehead</td>
<td>TM/SM 1 week</td>
<td>7 months</td>
</tr>
<tr>
<td>4</td>
<td>12, F</td>
<td>4/1994</td>
<td>10 days</td>
<td>Osteomyelitis Rt femur</td>
<td>TM/SM 4 weeks</td>
<td>–</td>
</tr>
<tr>
<td>5</td>
<td>14, F</td>
<td>9/1994</td>
<td>1 month</td>
<td>Pharyngitis, Rt cervical lymphadenitis</td>
<td>–</td>
<td>TM/SM + DX 5 weeks</td>
</tr>
</tbody>
</table>

*Underlying condition.

JRA, juvenile rheumatoid arthritis; CTZ, ceftazidime; TM/SM, trimethoprim–sulfamethoxazole; DX, doxycycline.

TABLE 4

Age, sex, month and year of presentation, treatment and duration of follow-up of 12 children who were treated with other oral regimens

<table>
<thead>
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<th>No</th>
<th>Age (years), Sex</th>
<th>Month and year of presentation</th>
<th>Duration of illness</th>
<th>Site of infection</th>
<th>Antibiotic treatment</th>
<th>Duration of follow-up</th>
</tr>
</thead>
<tbody>
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<td>Oral</td>
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<td></td>
<td>TM/SM + DX</td>
<td>Parenteral</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>TM/SM + DX</td>
<td>TM/SM + DX</td>
</tr>
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<td>1</td>
<td>5, M</td>
<td>7/2004</td>
<td>7 days</td>
<td>Suppurative parotitis, Rt</td>
<td>CTZ + CR 2 weeks</td>
<td>3 months</td>
</tr>
<tr>
<td>2</td>
<td>8, M</td>
<td>5/2006</td>
<td>7 days</td>
<td>Suppurative parotitis, Lt</td>
<td>CTZ 2 weeks TM/SM 5 days</td>
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</tr>
<tr>
<td>3</td>
<td>13, M (CRF)</td>
<td>6/2005</td>
<td>5 days</td>
<td>Urinary tract infection</td>
<td>CTZ 2 days</td>
<td>Not known</td>
</tr>
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<td>4</td>
<td>11, M</td>
<td>6/1999</td>
<td>7 days</td>
<td>Suppurative parotitis, Lt</td>
<td>CTZ 3 weeks + CR 3 days</td>
<td>–</td>
</tr>
<tr>
<td>5</td>
<td>11, F</td>
<td>6/1999</td>
<td>14 days</td>
<td>Suppurative parotitis, Rt</td>
<td>CR 1 week</td>
<td>Doxy 2 weeks</td>
</tr>
<tr>
<td>6</td>
<td>6, F</td>
<td>10/1999</td>
<td>6 days</td>
<td>Suppurative parotitis, Rt</td>
<td>CTZ 1 day</td>
<td>Amoxy-clav 2 weeks</td>
</tr>
<tr>
<td>7</td>
<td>5, M</td>
<td>7/2003</td>
<td>21 days</td>
<td>Suppurative parotitis, Lt</td>
<td>–</td>
<td>Amoxy-clav 1 week</td>
</tr>
<tr>
<td>8</td>
<td>5, F</td>
<td>5/2002</td>
<td>2 days</td>
<td>Pneumonia After near drowning</td>
<td>–</td>
<td>Amoxy-clav 3 weeks</td>
</tr>
<tr>
<td>9</td>
<td>9, M</td>
<td>8/1998</td>
<td>14 days</td>
<td>Abscess at lower part of neck</td>
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<td>(Cloxacillin)</td>
</tr>
<tr>
<td>10</td>
<td>3, F</td>
<td>10/2005</td>
<td>1 month</td>
<td>Abscess at Rt foot</td>
<td>–</td>
<td>(Cloxacillin)</td>
</tr>
<tr>
<td>11</td>
<td>3, F</td>
<td>11/1997</td>
<td>2 weeks</td>
<td>Rt posterior auricular lymphadenitis</td>
<td>–</td>
<td>(Cloxacillin)</td>
</tr>
<tr>
<td>12</td>
<td>12, F</td>
<td>4/2004</td>
<td>4 Pneumonia</td>
<td>–</td>
<td>(Amoxicillin)</td>
<td>1 week</td>
</tr>
</tbody>
</table>

*Underlying condition.

CRF, chronic renal failure; CTZ, ceftazidime; CR, Chloramphenicol; DX, doxycycline; TM/SM, trimethoprim sulfamethoxazole; Amoxy-clav, amoxicillin–clavulanic acid.
treatment of localized melioidosis in pediatric patients. In melioidosis with multiple sites of infection or cases with severe systemic symptoms, intravenous ceftazidime with or without trimethoprim–sulfamethoxazole is used. Once the desired clinical response has been achieved, discontinuation of parenteral treatment can be considered, whereas oral trimethoprim–sulfamethoxazole should be used for 12–20 weeks. For suppurative parotitis and non-severe skin and soft tissue infections, oral trimethoprim–sulfamethoxazole therapy without an initial intravenous phase may be used with a shorter duration of treatment [1, 2, 11, 16].

This study demonstrates that the clinical presentations of localized melioidosis in children cannot be differentiated from those caused by Staphylococcal infection and most of our patients were not obviously immunocompromised, therefore, many patients were initially treated with antistaphylococcal antibiotics before the culture results were available. In patients with mild skin and soft tissue infection, cultures were done only when there was no clinical improvement, therefore, localized melioidosis could be under-diagnosed even in endemic area. One patient (Table 4, Patient 12) presented with pneumonia then recovered after treatment with intravenous cefotaxime, followed by oral amoxicillin, despite a positive sputum culture for B. pseudomallei. This suggests the possibility of oropharyngeal colonization which is similar to other report of a wound colonization with B. pseudomallei in a 10-year-old girl [12]. It is also possible that a very mild infection in an immunocompetent host might recover by only adequate incision and drainage as was the case with Patients 9 and 11 (Table 4).

The limitations of this report are: (i) its descriptive nature and (ii) the ascertainment of long-term outcome by mail follow-up which might lead to recall bias. Ideally, decisions on antibiotic treatment regimens should be based on randomized controlled trials but this approach is unlikely because of the limited number of cases in children. Until further data are available, the result of this study suggests that trimethoprim–sulfamethoxazole can be used in the eradication phase of treatment for melioidosis in children. More information on the optimum antibiotic regimen and duration of treatment for localized melioidosis in children is needed.

References
