

# Case Report

## Listeriosis: Is It a Rare Disease in Thailand?

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*The prevalence of *Listeria monocytogenes* infection has been characterized as rare in Thailand. Within one month, 3 cases of listeriosis were seen at Vachira Phuket Hospital in Phuket, Thailand. Two cases were neonates with septicemia, of which one made an uneventful recovery and the other expired. The third case was an eleven-year-old boy with meningitis who also succumbed to his illness. All isolated *L. monocytogenes* were sensitive to ampicillin. An outbreak investigation revealed no *L. monocytogenes* contamination in tested food sources in Phuket.*

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*Listeria monocytogenes* is a facultative anaerobic, Gram-positive, non-spore-forming, non-branching bacilli that is found primarily in soil and water. Vegetables and animals can become contaminated with *L. monocytogenes* from the soil. Animals can carry *L. monocytogenes* without apparent infection. This bacterium can be found in variety of raw foods and in processed foods that are contaminated during or after processing. *L. monocytogenes* primarily affects immunocompromised persons, most notably neonates, mature-aged persons, and pregnant women. In rare cases, *L. monocytogenes* can cause diseases in healthy individuals. Ingestion of contaminated dairy products, vegetables, and fruits are the main route of infection. Septicemia and central nervous system infections are common in listeriosis. Enteritis has also been reported<sup>(1,2)</sup>. Listeriosis is rarely seen in Thailand, although a survey of fresh vegetables and raw meat samples in markets revealed an incidence of *L. monocytogenes* isolation between 3-15.7%<sup>(3)</sup>. We report 3 cases of listeriosis seen during the month of November 2013 at Vajira Phuket Hospital in Phuket, Thailand.

### Case Report

Within one month, 3 cases of listeriosis were

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admitted to Vachira Phuket Hospital and are described, as follows:

#### Case 1

A newborn boy who was delivered at 34 weeks gestation, with normal delivery, a birth weight of 2,830 grams, and an APGAR score of 8 at 1 and 5 minutes respectively. He became inactive, toneless, and peripherally cyanosed at 14 minutes after birth. His mother had fever and diarrhea 1 day prior to delivery. Consistent with a diagnosis of septic shock, cefotaxime 200 mg/kg/day and ampicillin 200 mg/kg/day were administered intravenously. Blood cultures of both patient and mother grew *L. monocytogenes*, which were sensitive to both cefotaxime and ampicillin. He gradually improved within 10 days after hospitalization to make a full and uneventful recovery.

#### Case 2

A newborn boy who was delivered at 31 weeks gestation, with normal delivery, and a birth weight of 1,940 grams developed cyanosis at birth, with a heart rate of less than 60 beats per minute. Cardiopulmonary resuscitation was performed and high-frequency oscillatory ventilation was maintained. Intravenous ampicillin 100 mg/kg/day and gentamicin 4.5 mg/kg/day were given. His chest roentgenogram showed whiteout of the lung. He expired at the age of 19 hours. His hemoculture grew *L. monocytogenes*, which was found to be sensitive to both ampicillin and gentamicin. His mother was healthy throughout the entire period of her pregnancy.

### Case 3

An 11-year-old boy had fever for five days and gradually became drowsy. Physical examination revealed neck stiffness. Lumbar puncture showed 149 white blood cells with 86% neutrophils, 14% lymphocytes, and numerous red blood cells. Cerebrospinal fluid (CSF) protein was 218 mg/dL and CSF/blood sugar was 32/156 mg/dL. Gram stain of CSF was negative. The patient was diagnosed with bacterial meningitis and was given cefotaxime 200 mg/kg/day, intravenously. Computed tomography (CT) of the brain showed tonsillar herniation. Patient CSF grew *L. monocytogenes* resistant to cefotaxime. He died on the sixth day of hospitalization.

### Discussion

*L. monocytogenes* causes several clinical manifestations in humans and domestic animals. Clinical listeriosis is especially severe with high mortality in immunocompromised individuals. Pregnant women, the elderly, and neonates are considered to be at high-risk for contracting listeriosis. One of the patients in this report, a neonate, deteriorated from the time of delivery and expired shortly thereafter. Acquisition of *L. monocytogenes* in both of the neonates profiled in this report was likely due to mother-to-child transmission during the peripartum period. One of the two mothers became ill during the peripartum period and her blood culture also grew *L. monocytogenes*. In pregnant women, listeriosis may be asymptomatic or may present as nonspecific clinical symptoms (e.g., flu-like symptoms, backache, headache, vomiting, diarrhea, muscle pains, and sore throat). Moreover, in pregnant women, listeriosis may cause inapparent chorioamnionitis, bacteremia, abortion, fetal death, or neonatal morbidity in the form of septicemia and/or meningitis. Despite extensive knowledge of *L. monocytogenes* pathogenesis, certain key elements regarding listeriosis during pregnancy and the prenatal period remain unknown<sup>(4,5)</sup>.

*L. monocytogenes* poses neurotropism to both the brain and meninges. Meningitis is much more frequently observed in central nervous system listeriosis, while the other central nervous system listeria infections (e.g., rhombencephalitis and brain abscess) are extremely rare<sup>(6-8)</sup>. In many countries, *L. monocytogenes* is not always included in the initial differential diagnosis as the causative pathogen of meningitis. This may have an impact on the empirical drug of choice in these patients. Cerebrospinal fluid findings in listeria meningitis are variable. A

preponderance of polymorphonuclear leukocytes in the cerebrospinal fluid is found in almost three-quarters of cases and protein level is usually moderately elevated and sugar level reduced<sup>(9)</sup>. The predisposing factors for acquiring listeriosis in the patients presented in this report are unclear. Our patients did not have any particular risk factors, such as ingestion of dairy products or raw meat. *L. monocytogenes* is found primarily in soil and water; as such, vegetables and animals can become contaminated with this bacterium from the soil. Furthermore, this bacterium can be found in processed foods that are contaminated during or after processing. Ingestion of *L. monocytogenes*-contaminated food is considered to be the source of nearly all human listeria infections<sup>(7,8)</sup>. *L. monocytogenes* is usually resistant to cephalosporins, as seen in our 11-year-old patient. Early diagnosis and appropriate antibiotic administration increases the odds of a favorable outcome<sup>(6-8)</sup>.

There have been no controlled studies to determine the antimicrobial of choice or the recommended duration of treatment in listeriosis. Ampicillin is considered to be the preferred drug for any form of listeria infection. Adding gentamicin to ampicillin has been shown to be an effective antimicrobial therapy in severe listeriosis on the basis of synergy in vitro and in animal models. Cephalosporins are not effective against *L. monocytogenes*. Early diagnosis and appropriate antibiotic administration increases the likelihood of a favorable outcome<sup>(6-8)</sup>.

### Conclusion

Three cases of listeriosis with unexplained acquisition of *L. monocytogenes* were seen within one month at Vachira Phuket Hospital in Phuket, Thailand. Since ingestion of *L. monocytogenes*-contaminated food is considered to be the source of nearly all human listeria infections, it is urgently necessary to identify the source(s) of contamination and to develop food production to consumption strategies that minimize or eliminate the risk of listeria contamination. Improved education regarding the disease, its transmission, and infection prevention measures is vital.

### What is already known on this topic?

*L. monocytogenes* primarily affects immunocompromised persons, most notably neonates, mature-aged persons, and pregnant women. In rare cases, *L. monocytogenes* can cause diseases in

healthy individuals. Ingestion of *L.monocytogenes*-contaminated food is considered to be the source of nearly all human listeria infections.

#### What this study adds?

Three cases of listeriosis with unexplained acquisition of *L. monocytogenes* were seen within one month at Vachira Phuket Hospital in Phuket, Thailand has an implication on an urgent necessity in identification of the contaminated food source(s).

The report emphasizes the importance of improved education regarding the disease, its transmission, and prevention measures.

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#### Potential conflicts of interest

None.

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### โรคลิสเทอริโอซิสพบได้น้อยในประเทศไทยจริงหรือ?

วีระศักดิ์ หล่อทองคำ, อุษา ทิทยากร

ในเดือนพฤศจิกายน พ.ศ. 2556 พบผู้ป่วยโรคลิสเทอริโอซิสในเด็กชาย 3 ราย มีการติดเชื้อในกระแสเลือด 2 รายโดยผู้ป่วยเป็นทารกแรกเกิดทั้งคู่ อีก 1 รายมีการติดเชื้อของเยื่อหุ้มสมองโดยผู้ป่วยเป็นเด็กอายุ 11 ปี ผู้ป่วยที่เสียชีวิต 2 รายเป็นผู้ป่วยที่มีการติดเชื้อในกระแสเลือด 1 รายและผู้ป่วยที่มีเยื่อหุ้มสมองอักเสบอีก 1 ราย การทดสอบความไวของเชื้อลิสทีเรีย โมโนไซโตเจเนสที่แยกได้จากผู้ป่วยพบว่าไวต่อยาคลัมเพนนิซิลลินจากการสอบสวนโรคไม่พบเชื้อลิสทีเรีย โมโนไซโตเจเนสในแหล่งอาหารในจังหวัดภูเก็ต