An outbreak of *Pantoea agglomerans* infection in the neonatal intensive care unit at Teaching Hospital, Kandy, Sri Lanka

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**Abstract**

**Introduction:** *Pantoea agglomerans* is an opportunistic pathogen which causes blood stream infection (BSI) due to contaminated intravenous fluids.

**Objective:** To investigate an outbreak of BSI in a neonatal intensive care unit (NICU) at Teaching Hospital Kandy (THK).

**Method:** Blood culture samples were collected from the neonates on admission to the NICU and 2 to 3 days later on clinical suspicion of BSI. The blood culture samples were processed according to standard methods and antibiotic susceptibility tests were carried out as per Clinical Laboratory Standards Institute guidelines. The environmental screening samples were cultured and identified using standard microbiological methods.

**Results:** Of the 55 blood cultures, 14 were positive for *P. agglomerans*. Nine of the 14 neonates responded to treatment with susceptible antibiotics. None of the environmental samples were positive for *P. agglomerans* species.

**Conclusion:** *P. agglomerans* was responsible for the outbreak of BSI in the NICU at THK.

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(Key words: *Pantoea* species, blood stream infection, neonatal intensive care unit)

**Introduction**

*Pantoea agglomerans* (formerly *Enterobacter agglomerans*) is a Gram negative aerobic bacillus in the family *Enterobacteriaceae*. All species of the genus *Pantoea* can be isolated from faeculent material, plants and soil¹, where they can be either pathogens or commensals². *Pantoea* species are clearly opportunistic pathogens and rarely cause disease in otherwise healthy individuals. Infections with *Pantoea* species are usually associated with an identifiable exogenous source³. Within the genus, *Pantoea agglomerans* (*P. agglomerans*) is the most commonly isolated species in humans resulting in soft tissue or bone/joint infections following penetrating trauma by vegetation⁴. *Pantoea* species have also been involved in epidemics of septicaemia due to contaminated intravenous fluid, total parenteral nutrition, blood products and the anaesthetic agent propofol⁴.

**Objective**

To investigate an outbreak of blood stream infection (BSI) in the neonatal intensive care unit (NICU) at the Teaching Hospital Kandy (THK) in March 2010.

**Method**

This study was carried out at the NICU, THK, which experienced an outbreak of blood stream infection during the period 5th to 30th March 2010. Blood culture samples were taken from all neonates who were admitted to the NICU during this period. The blood cultures were taken on admission to the NICU and 2 to 3 days later on clinical suspicion of BSI. The clinical diagnosis or suspicion of neonatal septicaemia was made by the paediatric unit responsible for the care of the patient. The clinical
isolates were identified by Gram staining, colony characteristics and the findings were confirmed by using the API 20E system. The antibiotic susceptibility tests were carried out as per Clinical Laboratory Standards Institute (CLSI) guidelines.

The environmental samples included samples from intravenous fluids, intravenous drugs, cleansing solutions, oxygen humidifiers, sterile water, incubators, cots, mattresses, ventilation masks, water taps, sinks, door handles and other instruments to identify the source of the outbreak. Environmental screening swabs were plated directly and solutions were enriched in BHI broth before plating. Cultures were identified using standard microbiological methods.

Results
During the study period 55 neonates were admitted to the NICU at THK. A total of 55 blood cultures were collected from these neonates. All the initial blood culture samples collected from the neonates on admission to the NICU were negative. Fourteen of the 55 blood culture samples that were collected 2 to 3 days after admission to the NICU became positive for *P. agglomerans*. Of the 14 blood culture positive neonates 12 were preterm and 2 were term babies. All the isolates shared the in vitro susceptibility to cefotaxime, ceftazidime, ceftriaxone, ciprofloxacin, gentamicin, amikacin, netilmicin, imipenem and meropenem. None of the environmental samples were positive for *P. agglomerans* species. Nine of the 14 neonates responded to treatment with antibiotics to which the organism was susceptible. However, 5 neonates died due to sepsis in spite of appropriate antibiotic therapy.

Discussion
The NICU at the THK experienced an outbreak of 14 cases of *Pantoea agglomerans* BSI during a period of 26 days. *Pantoea* species infections are not prevalent in humans. There are few reports of systemic infections with this organism in preterm neonates5. Surveillance between January 2005 and December 2006 in NICUs at two Teaching Hospitals in Kuwait reported five sporadic episodes of nosocomial blood stream infections due to *P. agglomerans* species5. In previous reports, *Pantoea* infections among preterm neonates, primarily sepsis, were basically related to hospital outbreaks caused by this organism and traced to contamination by parenteral nutrition fluids5. This was the 'world’s largest outbreak of blood stream infection in a NICU by *Pantoea* species.

Conclusion
*P. agglomerans* was responsible for the neonatal BSI outbreak in the NICU at the THK, although the source of these *Pantoea* infections remains unclear.

References