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Infection control measures and clinical aspects of a large enterovirus outbreak in a neonatal intensive care unit

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Background: Hospital-acquired infections caused by viruses are of considerable morbidity and sometimes mortality in critically ill neonates. During peak community virus transmission, visitors and healthcare workers may have a role in the introduction and transmission of the viruses in the neonatal intensive care unit (NICU). There are few relates in literature about the best management regarding infection control measures and clinical outcomes facing an enterovirus NICU outbreak. Here we describe our experience, in a 27-bed NICU of a private hospital in Porto Alegre, Brazil

Material/methods: On December 6th 2014, NICU staff identified a simultaneous worsening in clinical pattern of 4 newborns. With a suspicion of a outbreak the medical supervisor of the NICU with the support of the Infection Control Service promptly called for closing NICU for new hospitalizations. Maximum barrier precaution measures were installed as well as staff cohorting, hand hygiene promotion, restriction of people circulation and escalation of cleaning and disinfection environment procedures. We identified a newborn that was admitted in NICU coming from home with fever as the main symptom in November 30th. One of his householders also had symptomatology of a viral disease. Diagnostic strategy included an multiplex Polymerase Chain Reaction (PCR) assay, that was positive for Enterovirus. All sequential symptomatic patients were tested with PCR assay for Enterovirus in blood, feces and/or cerebrospinal fluid. Clinical follow up was made monthly after discharge for all patients (cases and free-of disease newborns) for one year

Results: Sixteen newborns acquired enterovirus, 12 became ill (attack rate of 60%). The incubation period ranged from 4 to 17 days. Ten patients were male. Gestational age ranged from 25 to 38 weeks. All symptomatic patients had fever; 50% presented apnea, saturation fall, hypoactivity, abdominal distention and tachypnea. 3 patients developed myocarditis and 4 developed encephalitis.

Enterovirus RNA was detected in all of 16 plasma and 8 cerebrospinal fluid specimens tested. Intravenous immunoglobulin was indicated for all 12 symptomatic cases. Only one case had neurologic sequelae (psychomotor retardation) after one year follow up. After 22 days with no new cases, we considered total control of the outbreak and NICU was reopened for new admissions in January 8th, 2015. The unit remained with individualized care for patients who had identified enterovirus up to the last discharge date in April 10th , 2015. Finally, we were able to identify the subtype of enterovirus: Coxsackievirus type B1

Conclusions: Our findings demonstrate the potential for enteroviruses to cause widespread illness among newborns and stress the importance of recognizing community peak viruses as a cause of hospital-acquired infections. Moreover, underline the importance of coordinate actions of NICU and infection control team to interrupt viral transmission