



ORIGINAL ARTICLE

Clinical observation of newborns with infection risk:  
A safe practice ☆,☆☆



Carla Escribano García\*, María del Mar Montejo Vicente,  
Raquel Izquierdo Caballero, Carmen María Samaniego Fernández,  
Sara Isabel Marín Urueña, María Elena Infante López, Sonia Caserío Carbonero

Servicio de Pediatría, Unidad Neonatología, Hospital Universitario Río Hortega, Valladolid, Spain

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Neonatal screening;  
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Abstract

**Introduction:** Early-onset neonatal sepsis refers to an infection which starts during the first 72 h of birth, and can lead to significant morbidity and mortality. Scientific evidence shows that infected infants present with symptoms during the first hours after delivery. There has been a significant decrease in this condition with the implementation of guidelines for its prevention. However, international guidelines still recommend the evaluation of these infants using painful tests.

**Material and methods:** A prospective cohort study was conducted on all asymptomatic infants born at >35 weeks gestation with one or more risk factors in a single tertiary care centre from 2011 to 2015. They were periodically observed in newborn nursery from admission until discharge looking for signs of infection.

**Results:** Out of the 9,424 babies born during this period, 1,425 were included in the study. A total of 53 infants were admitted to the neonatal unit, half of them because of sepsis suspicion. Finally, just 7 were discharged with the diagnosis of sepsis. All these 7 presented with symptoms during their first 72 h of life. No sepsis was reported in asymptomatic infants.

**Conclusions:** Truly infected infants present with symptoms during their first hours of life. This study supports the observation of infants at risk as a safe practice to detect early-onset sepsis.  
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☆☆ Previous presentation: This study has been presented at the XXIII Congreso de Neonatología y Medicina Perinatal of the Sociedad Española de Neonatología, October 5–7, 2011; Oviedo, Spain; the XXIV Memorial Guillermo Arce y Ernesto Sanchez-Villares, November 25–26, 2011; Oviedo, Spain, and the XXIV Congreso de Neonatología y Medicina Perinatal and IV Congreso de Enfermería Neonatal; October 2–4, 2013; Barcelona, Spain.

\* Corresponding author.

E-mail address: [carescg@gmail.com](mailto:carescg@gmail.com) (C. Escribano García).

**PALABRAS CLAVE**

Screening neonatal;  
Sepsis neonatal  
precoz;  
Infección neonatal

**Observación clínica de recién nacidos con factores de riesgo infeccioso, una práctica segura****Resumen**

**Introducción:** La sepsis vertical precoz es una causa importante de morbimortalidad neonatal. La evidencia científica apunta a que la mayoría de los recién nacidos infectados presentan síntomas en las primeras horas de vida. Tras la aplicación de las medidas para la prevención de sepsis vertical y el descenso en su incidencia, se han propuesto cambios en el manejo de estos niños. No obstante, la realización de exploraciones complementarias dolorosas aún sigue siendo una práctica muy extendida.

**Material y métodos:** Estudio prospectivo realizado entre 2011 y 2015. Se incluyó a todos los recién nacidos con edad gestacional  $\geq 35$  semanas, asintomáticos al nacimiento que presentaban uno o más factores de riesgo infeccioso. Durante su estancia en maternidad se realiza observación clínica periódica para la detección de síntomas compatibles con infección.

**Resultados:** De los 9.424 recién nacidos en este periodo, 1.425 cumplían los criterios de inclusión del estudio; 53 pacientes precisaron ingreso, la mitad de ellos por sospecha de infección, confirmándose finalmente solo en 7 este diagnóstico. Todos los pacientes presentaron clínica en las primeras 72 h de vida.

**Conclusiones:** Los niños con factores de riesgo infeccioso que desarrollan una infección presentan clínica de forma precoz en las primeras horas tras el nacimiento. Este trabajo apoya la observación clínica estrecha como medida suficiente y segura para la detección de la sepsis neonatal precoz.

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**Introduction**

Based on the criteria adopted by the Grupo de Hospitales Castrillo (Castrillo Hospital Group [GHC]), systemic inflammatory response syndrome (SIRS) is defined as the presence of clinical manifestations (toxic appearance and/or 2 or more symptoms or signs of infection) and positive laboratory tests, and neonatal sepsis as presence of SIRS with evidence of infection, that is, isolation of a pathogen from blood culture. Similarly, based on the criteria of this working group, we define vertically transmitted neonatal sepsis as infection within 72 h of life where nosocomial infection has been ruled out.<sup>1,2</sup> This is a significant cause of neonatal morbidity and mortality.<sup>3–5</sup> Historically, the most frequent aetiological agent has been group B streptococcus (GBS) or *Streptococcus agalactiae* (30–50%), followed by *Escherichia coli* (*E. coli*) (26%).<sup>6,7</sup> However, based on the 2015 data presented at the meeting of the GHC in 2016 whose publication is still pending, *E. coli* (35.7%) has overtaken GBS (31.4%) as the main causative agent of vertically transmitted early-onset sepsis. Other pathogens, such as *Staphylococcus aureus*, *Enterococcus faecalis* and *Listeria monocytogenes*, are involved less frequently.<sup>2,5</sup>

In the 1970s, the incidence of early-onset neonatal sepsis associated with GBS in the absence of preventive interventions was as high as 3 cases per 1,000 births. Following the publication of the recommendations for the prevention of perinatal group B streptococcal disease by the Centers of Disease Control and Prevention (CDC) in 1996 and their 2002 and 2010 updates and the introduction of intrapartum antibiotic prophylaxis in cases with risk factors, we have witnessed

a decrease in the incidence of sepsis of any aetiology, and especially of sepsis caused by GBS.<sup>1,8</sup> However, GBS is still a frequent cause of sepsis in term and late preterm newborns.

At present, the incidence of vertically transmitted early-onset sepsis in countries that implement preventive measures is of around 0.9–1 per 1,000 live births, with an incidence of confirmed vertically-transmitted sepsis (with positive cultures) of 0.76–0.9 per 1000 live births.<sup>9,10</sup> In Spain, based on data of the GHC, there has been a marked decrease from 1.25 per 1,000 live births in 1996 to approximately 0.7 per 1,000 live births in 2005, with a spike of 0.96 per 1,000 births in 2015 (unpublished data).<sup>11</sup>

Thanks to the introduction of preventive measures, mortality has dropped from 50% in the 1970s to 4–5% of affected full-term newborns at present.<sup>12</sup> This illness is associated with significant morbidity, and patients may develop neurologic sequelae or sensory impairment.<sup>13,14</sup>

The causative microorganisms are commensal bacteria of the gastrointestinal tract, which is the main reservoir and from which bacteria can spread to the vaginal cavity. Maternal colonisation is the main risk factor for the development of vertically transmitted sepsis. The presence of bacteria in the urine at any point during gestation is associated with an increased risk of neonatal sepsis, as it is indicative of significant maternal colonisation. It is estimated that overall, between 10% and 30% of women carry GBS during pregnancy; the prevalence of colonisation by other bacteria is unknown since screening for other pathogens is not performed routinely.<sup>7</sup> In Spain, the documented rate of colonisation ranges between 10% and 18%.<sup>6</sup> The mechanism of vertical transmission involves infection of the newborn

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