



ORIGINAL ARTICLE

Five steps to decreasing nosocomial infections in very preterm newborns: A quasi-experimental study^{☆,☆☆}



Ana García González^{*}, José Luis Leante Castellanos, Carmen Fuentes Gutiérrez, José María Lloreda García, José Ramón Fernández Fructuoso, Elisabet Gómez Santos, Verónica García González

Sección de Neonatología, Servicio de Pediatría, Hospital General Universitario Santa Lucía, Cartagena, Murcia, España

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KEYWORDS

Nosocomial infection;
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Strategies to reduce
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Breastfeeding;
Catheter-associated
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Abstract

Objectives: An evaluation is made of the impact of a series of five interventions on the incidence of hospital-related infections in a level III neonatal unit.

Material and methods: Quasi-experimental, pre-post intervention study, which included preterm infants weighing 1500 g at birth or delivered at <32 weeks gestation, admitted in the 12 months before and after the measures were implemented (January 2014). The measures consisted of: optimising hand washing, following a protocol for insertion and handling of central intravenous catheters, encouraging breastfeeding; applying a protocol for rational antibiotic use, and establishing a surveillance system for multi-resistant bacteria. The primary endpoint was to assess the incidence of hospital-acquired infections before and after implementing the interventions.

Results: Thirty-three matched patients were included in each period. There was an incidence of 8.7 and 2.7 hospital-related infections/1000 hospital stay days in the pre- and post-intervention periods, respectively ($P < .05$). Additionally, patients in the treatment group showed a statistically-significant decrease in days on mechanical ventilation, use of blood products, and vasoactive drugs.

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^{*} Corresponding author.

E-mail address: galapagos772000@yahoo.es (A. García González).

PALABRAS CLAVE

Infección relacionada con la asistencia sanitaria;
Neonato prematuro;
Estrategias para disminuir las infecciones;
Lactancia materna;
Infecciones asociadas a catéter

Conclusions: The strategy, based on implementing five specific measures in a unit with a high rate of hospital-related infections, proved effective in reducing their incidence. This reduction could contribute to lowering the use of mechanical ventilation, blood products, and vasoactive drugs.

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Cinco pasos para la disminución de las infecciones relacionadas con la asistencia sanitaria en prematuros de muy bajo peso. Estudio cuasiexperimental

Resumen

Objetivos: El objetivo de este estudio fue evaluar el impacto de un conjunto de 5 intervenciones sobre la incidencia de infecciones relacionadas con la asistencia sanitaria en una unidad de Neonatología de nivel III.

Material y métodos: Estudio cuasiexperimental pre-postintervención. Se incluyó a aquellos prematuros con peso al nacimiento < 1.500 g o edad gestacional < 32 semanas que ingresaron en los 12 meses previos y posteriores a la implantación de las medidas (enero del 2014). Las intervenciones consistieron en optimizar la higiene de manos, protocolizar la inserción y la manipulación de catéteres intravenosos centrales, fomentar la alimentación con leche materna, implantar una política de uso racional de antibióticos y establecer un sistema de vigilancia epidemiológica de gérmenes multirresistentes. Como variable principal se analizó la densidad de incidencia de infecciones relacionadas con la asistencia sanitaria antes y después de implementar las medidas.

Resultados: Fueron incluidos 33 pacientes en cada período, homogéneos en edad gestacional, peso y otras variables demográficas. Se constató una densidad de incidencia de 8,7 y 2,7 infecciones/1.000 días de estancia en los períodos pre y postintervención respectivamente ($p < 0,05$). También se halló una disminución estadísticamente significativa en el porcentaje de días en ventilación mecánica, así como de pacientes que recibieron hemoderivados y fármacos vasoactivos.

Conclusiones: Esta estrategia, basada en la puesta en marcha de 5 medidas concretas, fue efectiva en la disminución de infecciones relacionadas con la asistencia sanitaria en una unidad con tasas elevadas de dichas infecciones. Esta reducción pudo contribuir a una menor tasa de empleo de ventilación mecánica, hemoderivados y fármacos vasoactivos en el período postintervención. © 2016 Asociación Española de Pediatría. Publicado por Elsevier España, S.L.U. Todos los derechos reservados.

Introduction

Nosocomial infections are one of the main challenges we face in the management of very preterm newborns in neonatal intensive care units (NICUs), and it is one of the leading causes of morbidity and mortality in this population. The World Health Organization estimates that there are 4 million neonatal deaths a year, of which one third are due to severe infection.¹

The incidence of nosocomial infection is higher in patients with birth weights of less than 1500 g, and mortality is higher in this population.² On the other hand, the indiscriminate use of antibiotics can promote infection by drug-resistant pathogens that are associated with higher mortality rates.³ Effective strategies to prevent nosocomial infections in NICUs need to be established.⁴

The risk factors for the development of nosocomial infections include those intrinsic to the patient, such as gestational age and weight at birth, genetic predisposition, the

permeability of skin and mucosal barriers, male sex and immunosuppression,⁵ and extrinsic factors related to the interventions implemented in the NICU.

Chief among the extrinsic factors is the use of external devices, such as ventilatory support devices and especially central venous catheters^{5,6} and the administration of parenteral nutrition.⁷ The other key factor concerns human resources. Poor adherence with hand hygiene measures and inappropriate nurse-to-patient ratios are associated with an increase in the incidence of nosocomial infections and outbreaks of infection by multidrug-resistant pathogens.⁸

Other extrinsic factors associated with increases in the incidence of nosocomial infection are delayed initiation of enteral feeding, administration of ranitidine, prolonged antibiotic treatment and postnatal steroids use.^{5,9}

The literature on the prevention of nosocomial infection is extensive. Some of the proposed measures are hand hygiene,¹⁰ aseptic technique in the handling of intravenous catheters,¹¹ promoting breastfeeding,¹² limiting the use

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