



Revista Colombiana de Anestesiología

Colombian Journal of Anesthesiology

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Scientific and Technological Research

Impact of hypothermia during craniostomosis repair surgery[☆]



Víctor Hugo González-Cárdenas^{a,*}, María Victoria Vanegas-Martínez^{b,f},
María Elvira Rojas-Rueda^{c,f}, Claudia Cecilia Burbano-Paredes^{d,f},
Nadya Tatiana Pulido-Barbosa^e

^a Anaesthetist Physician, Clinical Epidemiologist, Leader and Coordinator, Deorum Opus-Fundación Universitaria de las Ciencias de la Salud (FUCS) Research Group, Fundación Hospital Infantil Universitario de San José Faculty, Universidad de la Sabana, Bogotá, DC, Colombia

^b Physician, Cardiothoracic Anaesthetist, Deputy Medical and Education Director, Fundación Hospital Infantil Universitario de San José, Bogotá, DC, Colombia

^c Anaesthetist Physician, Surgical Unit Coordinator and Head of the Anaesthesia Service, Fundación Hospital Infantil Universitario de San José, Bogotá, DC, Colombia

^d Anaesthetist Physician, Fundación Hospital Infantil Universitario de San José, Bogotá, DC, Colombia

^e Resident Physician, Anaesthesia Programme, Fundación Universitaria de las Ciencias de la Salud, Bogotá, DC, Colombia

^f Fundación Universitaria de las Ciencias de la Salud (FUCS), Bogotá, DC, Colombia

ARTICLE INFO

Article history:

Received 9 July 2015

Accepted 6 April 2016

Available online 1 June 2016

Keywords:

Hypothermia

Mortality

Morbidity

Craniosynostoses

Blood transfusion

ABSTRACT

Introduction: Hypothermia is recognized as a risk factor for perioperative complications in paediatric patients. High surgical risk procedures serve as a model of exposure to that risk factor. In particular, surgical correction of craniostomosis serves as a model for measuring the impact of hypothermia.

Objective: To assess hypothermia-related morbidity and mortality in paediatric patients taken to craniostomosis correction.

Methodology: Historical cohort study of patients taken to craniostomosis correction and exposed to hypothermia.

Results: With prior approval of the Ethics Committee of the institution, 54 records were included in the analysis. No statistically significant differences were found between hypothermia and its impact in terms of morbidity and mortality (death, major bleeding, massive haemorrhage massive transfusion, disseminated intravascular coagulation, need for vasopressor support, mechanical ventilation time and length of stay, including admission

[☆] Please cite this article as: González-Cárdenas VH, Vanegas-Martínez MV, Rojas-Rueda ME, Burbano-Paredes CC, Pulido-Barbosa NT. Impacto de la hipotermia durante la intervención quirúrgica de craneosinostosis. Rev Colomb Anestesiología. 2016;44:235-241.

* Corresponding author at: Fundación Hospital Infantil Universitario de San José, Oficina de Anestesiología, Carrera 52 # 67 A 71, Cuarto Piso, Bogotá, DC, Colombia.

E-mail address: vhgonzalez@fucsalud.edu.co (V.H. González-Cárdenas).

to the intensive care unit). A clinically significant increase in bleeding (severe and massive) and severe hypothermia was found (28.6% vs. 40% and 14.3% vs. 40%, respectively).

Conclusions: No statistical differences were found in terms of morbidity and mortality with severe hypothermia (and moderate/severe hypothermia).

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Impacto de la hipotermia durante la intervencion quirurgica de craneosinostosis

R E S U M E N

Palabras clave:

Hipotermia
Mortalidad
Morbilidad
Craneosinostosis
Transfusión sanguínea

Introducción: La hipotermia es un reconocido factor de riesgo de complicaciones perioperatorias en pacientes pediátricos. Para el estudio de sus impactos, las cirugías de alto riesgo quirúrgico se comportan como un modelo de exposición a dicho factor de riesgo. En este punto, la corrección quirúrgica de Craneosinostosis se comporta como un modelo para la medición de los impactos de la hipotermia.

Objetivo: Evaluar morbilidad y mortalidad relacionada a hipotermia en pacientes pediátricos llevados a corrección de Craneosinostosis.

Metodología: Estudio de Cohorte Histórico en pacientes pediátricos llevados a corrección de Craneosinostosis expuestos a hipotermia.

Resultados: Previa aprobación del Comité de Ética Institucional, incluimos 54 registros en el análisis. No encontramos diferencias estadísticamente significativas entre Hipotermia e Impactos en terminos de morbilidad (Mortalidad, Hemorragia Severa, Hemorragia Masiva, Trasfusión Masiva, Coagulación Intravascular Diseminada, Necesidad de Soporte Vasopresor y Tiempos de Ventilación Mecánica, y Hospitalización, incluso en Cuidado Intensivo). Hallamos un aumento clínicamente significativo en la hemorragia (severa y masiva) e Hipotermia Severa, (28.6% Vs. 40% y 14.3% Vs. 40%, respectivamente).

Conclusiones: La hipotermia severa (y moderada a severa) no demostro en nuestros pacientes diferencias estadísticas para morbilidad y mortalidad.

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Introduction

As a risk factor for perioperative complications, hypothermia has been found to increase morbidity and mortality in paediatric patients. In the therapeutic context, the use of mild hypothermia has been advocated because of its neuroprotective effects and minor complications when compared with other more severe levels of hypothermia.¹⁻³

Surgery for craniosynostosis repair in the paediatric population has been characterized as a subspecialized procedure with high rates of bleeding, transfusions and complications, primarily of hematologic nature.

An analysis of prior databases in our institution revealed that some complications (morbidity) would appear to change in incidence as a direct result of hypothermia. In the Colombian study by González et al.,⁴ the prevalence of disseminated intravascular coagulation (DIC) after craniosynostosis correction surgery was 35%, pointing to hypothermia as a probable causal factor according to the internal post hoc analyses.

Aware of the significance of this issue, a systematic review of the literature was conducted in PUBMED and LILACS with no restrictions of time, language or type of publication. The

search terms *Hypothermy AND Craniosynostoses*, and *Hypothermia AND Craneosinostosis*, respectively, were used initially. No articles were found using these strategies. Then, when the terms *Hypothermy, Surgical Procedures Operative AND Paediatric* were used, the search yielded four publications in the form of review articles with information similar to the one cited previously; and six citations were found for the descriptors *Hipotermia, Cirugia, AND Pediatria* in the form of review articles or case reports (four) plus an additional two more focused on the effects on patients under cardiopulmonary by-pass circulation undergoing cardiovascular procedures. With this latter information it was not possible either to consider a hypothesis to answer our questions. In view of the above, it was concluded that there is a significant information gap regarding the impact of intraoperative hypothermia in paediatrics, which is even more notorious in non-cardiac high-complexity and high surgical risk procedures.⁵⁻⁷

Based on the scant evidence at the present time, and given the unknown impact of exposure to hypothermia, this study was developed with the aim to assess the impact of moderate/severe and severe hypothermia on morbidity and mortality associated with the surgical correction of craniosynostosis.

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