Factores clínicos, quirúrgicos y hemodinámicos asociados al sangrado postoperatorio en cirugía cardíaca con reversión de Heparina en proporción 1:1 de protamina en un centro de referencia del Caribe Colombiano durante el 2024

Nombres y apellidos:

Yoeel David López Cuello
Código estudiantil: 2022116739493

Ángelo Jorge Leonardo Vallejo Lago
Código estudiantil: 2020113420154

Trabajo de Investigación presentado como requisito para optar el título de:

Especialista en Anestesiología

Tutores:

Dr. Hernando de Jesús Correa Sánchez
MD | Spec. Anestesiología

Dr. Henry Joseth González Torres
Bio. | Spec. App. Stat. | M.Sc. Bio. (GenPop) | Dr.Sc. BioMed

RESUMEN

El sangrado postoperatorio en cirugía cardíaca es una complicación frecuente, asociada con mayor morbimortalidad y uso de hemoderivados. Aunque la reversión de heparina con protamina 1:1 es el estándar, persiste variabilidad en la respuesta hemostática y en la incidencia de sangrado significativo. La evidencia sobre los factores que determinan este riesgo sigue siendo limitada en Latinoamérica y en el Caribe colombiano.

Objetivo: Identificar los factores clínicos, quirúrgicos y hemodinámicos asociados al sangrado postoperatorio significativo en pacientes sometidos a cirugía cardíaca con circulación extracorpórea y reversión de heparina en proporción 1:1 de protamina durante el periodo 2024.

Metodología: Se desarrolló un estudio retrospectivo, analítico y observacional en un centro de referencia del Caribe colombiano. Se incluyeron 153 pacientes ≥18 años sometidos a cirugía cardíaca con circulación extracorpórea y reversión estándar con protamina. Las variables evaluadas incluyeron características clínicas, tiempos quirúrgicos (CEC y clamp aórtico), valores de ACT, uso previo de antiagregantes, tipo de procedimiento y desenlaces posoperatorios (reintervención, transfusiones, mortalidad, estancia UCI y hospitalaria). Las comparaciones se realizaron mediante Wilcoxon, Chi-cuadrado/Fisher y regresión logística multivariada con selección backward para identificar predictores independientes de sangrado y estancia prolongada.

Resultados: La prevalencia de sangrado postoperatorio significativo (SPS) fue del 37 %. Los pacientes con SPS presentaron mayor frecuencia de insuficiencia mitral, mayor uso de clopidogrel y mayor proporción de procedimientos complejos (RVA y CRM). En el análisis ajustado, los predictores independientes de SPS fueron: reemplazo valvular abierto (OR 9.4), cirugía de revascularización miocárdica (OR 10.8), insuficiencia mitral (OR 4.08), uso previo de clopidogrel (OR 4.27) y cateterismo cardíaco (OR 4.12). El SPS se asoció con mayor necesidad de transfusiones y mayor tasa de reintervención, aunque sin diferencias significativas en mortalidad intrahospitalaria. La estancia hospitalaria prolongada (>48 h) estuvo más relacionada con la presencia de SPS y con la complejidad quirúrgica que con variables clínicas basales.

Conclusión: El sangrado postoperatorio significativo en cirugía cardíaca con reversión 1:1 se asoció principalmente con la complejidad del procedimiento, el uso de antiagregantes y ciertos diagnósticos preoperatorios, más que con las comorbilidades habituales. La normalización del ACT no aseguró una hemostasia efectiva. Estos resultados refuerzan la necesidad de mejorar la evaluación hemostática y la estratificación preoperatoria del riesgo.

Palabras clave: sangrado postoperatorio; cirugía cardíaca; circulación extracorpórea; protamina; reversión de heparina; factores de riesgo; hemostasia; reintervención.

ABSTRACT

Postoperative bleeding in cardiac surgery is a frequent complication, associated with increased morbidity, mortality, and use of blood products. Although heparin reversal with protamine at a 1:1 ratio is the standard approach, considerable variability persists in the hemostatic response and in the incidence of significant bleeding. Evidence on the factors that determine this risk remains limited in Latin America and particularly in the Colombian Caribbean.

Objective: To identify the clinical, surgical, and hemodynamic factors associated with significant postoperative bleeding in patients undergoing cardiac surgery with cardiopulmonary bypass and 1:1 protamine heparin reversal during the 2024 period.

Methods: A retrospective, analytical, observational study was conducted at a referral center in the Colombian Caribbean. A total of 153 patients aged ≥18 years undergoing cardiac surgery with cardiopulmonary bypass and standard protamine reversal were included. Variables assessed included clinical characteristics, surgical times (CPB and aortic cross-clamp), ACT values, prior antiplatelet use, type of procedure, and postoperative outcomes (reintervention, transfusions, mortality, ICU and hospital length of stay). Comparisons were performed using Wilcoxon, Chi-square/Fisher tests, and multivariate logistic regression with backward selection to identify independent predictors of bleeding and prolonged hospital stay.

Results: The prevalence of significant postoperative bleeding (SPB) was 37%. Patients with SPB had a higher frequency of mitral insufficiency, greater clopidogrel use, and a higher proportion of complex procedures (valve replacement and coronary artery bypass grafting). In the adjusted analysis, independent predictors of SPB were: open valve replacement (OR 9.4), coronary artery bypass grafting (OR 10.8), mitral insufficiency (OR 4.08), prior clopidogrel use (OR 4.27), and prior cardiac catheterization (OR 4.12). SPB was associated with increased transfusion requirements and higher reintervention rates, although in-hospital mortality did not differ significantly. Prolonged hospital stay (>48 h) was more strongly associated with SPB and surgical complexity than with baseline clinical variables.

Conclusion: Significant postoperative bleeding in cardiac surgery with 1:1 heparin reversal was primarily associated with procedural complexity, antiplatelet exposure, and specific preoperative diagnoses, rather than traditional comorbidities. ACT normalization did not ensure effective hemostasis. These findings reinforce the need to improve hemostatic assessment and preoperative risk stratification.

Keywords: postoperative bleeding; cardiac surgery; cardiopulmonary bypass; protamine; heparin reversal; risk factors; hemostasis; reoperation.

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