



## ORIGINAL ARTICLE

# An economic evaluation of two interventions for the prevention of post-surgical infections in cardiac surgery<sup>☆</sup>



J. del Diego Salas<sup>a</sup>, A. Orly de Labry Lima<sup>b,c,\*</sup>, J. Espín Balbino<sup>b,c</sup>,  
C. Bermúdez Tamayo<sup>b,c,d</sup>, J. Fernández-Crehuet Navajas<sup>a,e</sup>

<sup>a</sup> Department of Preventive Medicine, Virgen de la Victoria University Hospital, Malaga, Spain

<sup>b</sup> Andalusian School of Public Health (EASP), Campus Universitario de Cartuja, Granada, Spain

<sup>c</sup> CIBER in Epidemiology and Public Health (CIBERESP), Spain

<sup>d</sup> Institute de Recherche en Santé Publique, Université de Montréal, Canada

<sup>e</sup> Department of Preventive Medicine, University of Malaga, Malaga, Spain

Received 29 January 2015; accepted 18 August 2015

Available online 18 November 2015

### KEYWORDS

Methicillin-resistant  
*Staphylococcus aureus*;  
Thoracic surgery;  
Cost and cost analysis

### Abstract

**Objective:** To conduct a cost-effectiveness analysis that compares two prophylactic protocols for treating post-surgical infections in cardiac surgery.

**Methods:** A cost effectiveness analysis was done by using a decision tree to compare two protocols for prophylaxis of post-surgical infections (Protocol A: Those patient with positive test to methicillin-resistant *Staphylococcus aureus* (MRSA) colonization received muripocin (twice a day during a two-week period), with no follow-up verification. Those who tested negative did not receive the prophylaxis treatment; Protocol B: all patients received the mupirocin treatment). The number of post-surgical infections averted was the measure of effectiveness from the health system's perspective, 30 days following the surgery. The incidence of infections and complications was obtained from two cohorts of patients who underwent cardiac surgery Hospital. The times for applying the two protocols were validated by experts. They cost were calculated from the hospital's analytical accounting management system and Pharmaceutical Service. Only direct costs were taken into account, no discount rates were applied. Incremental cost-effectiveness ratio (ICER) was calculated. A probabilistic sensitivity analysis was performed.

<sup>☆</sup> This work was awarded a prize from the Royal Academy of Medicine for Eastern Andalusia (the *Colegio Oficial de Médicos* prize) and have also been incorporated into the Andalusian School of Public Health's (*Escuela Andaluza de Salud Pública*) curriculum for its Master's degree in Public Health and Health Management.

\* Corresponding author.

E-mail address: [antonio.olrylabry.easp@juntadeandalucia.es](mailto:antonio.olrylabry.easp@juntadeandalucia.es) (A. Orly de Labry Lima).

**PALABRAS CLAVE**

*Staphylococcus aureus* resistente a la meticilina;  
Cirugía torácica;  
Coste y análisis del coste

**Results:** A total of 1118 patients were included (721 in Protocol A and 397 in Protocol B). No statistically significant differences were found in age, sex, diabetes, *exitus* or length of hospital stay between the two protocols. In the control group the rate of infection was 15.3%, compared with 11.3% in the intervention group. Protocol B proves to be more effective and at a lower cost, yielding an ICER of €32,506.

**Conclusion:** Universal mupirocin prophylaxis against surgical site infections (SSI) in cardiac surgery as a dominant strategy, because it shows a lower incidence of infections and cost savings, versus the strategy to treat selectively patients according to their test results prior screening.

© 2015 SECA. Published by Elsevier España, S.L.U. All rights reserved.

## Evaluación económica de dos intervenciones de prevención de infecciones posquirúrgicas en cirugía cardíaca

### Resumen

**Objetivo:** Realizar un análisis de coste-efectividad que compare dos protocolos profilácticos para el tratamiento de infecciones posquirúrgicas en cirugía cardíaca.

**Métodos:** El análisis de coste-efectividad se llevó a cabo mediante un árbol de decisiones para comparar dos protocolos sobre profilaxis de infecciones posquirúrgicas (en el protocolo A, los pacientes con resultado positivo por colonización de *Staphylococcus aureus* resistente a la metilina (SARM) recibieron mupirocina (dos veces al día durante 2 semanas) sin verificación de seguimiento. Aquéllos con resultado negativo no recibieron profilaxis. En el protocolo B, todos los pacientes recibieron el tratamiento con mupirocina). La medida de la efectividad fue el número de infecciones posquirúrgicas que se habían evitado a los 30 días desde la perspectiva del sistema de salud. La incidencia de infecciones y complicaciones se obtuvo a partir de dos cohortes de pacientes a quienes se practicó cirugía cardíaca. Algunos expertos validaron los tiempos de aplicación de los dos protocolos. Los costes se calcularon a partir del sistema de contabilidad analítica del hospital y el Servicio de Farmacia. Sólo se tuvieron en cuenta los costes directos y no se aplicaron tasas de descuento. Se calculó la relación de coste-efectividad incremental (ICER) y se realizó un análisis de sensibilidad probabilístico.

**Resultados:** se incluyó a 1.118 pacientes (721 en el protocolo A y 397 en el protocolo B). No hubo diferencias estadísticamente significativas en cuanto a edad, sexo, diabetes, muerte o duración de la estancia hospitalaria entre los dos protocolos. En el grupo control, la tasa de infección alcanzó el 15,3% y el 11,3% en el grupo de intervención. El protocolo B ha demostrado ser más eficaz y con menor coste, pues se ha obtenido un ICER de 32.506€.

**Conclusión:** la profilaxis universal con mupirocina frente a infecciones en el sitio quirúrgico (SSI) en cirugía cardíaca se muestra como una estrategia dominante ya que muestra menor incidencia de infecciones y un ahorro de costes que la estrategia para tratar selectivamente a los pacientes de acuerdo con los resultados obtenidos en la prueba de cribado previa.

© 2015 SECA. Publicado por Elsevier España, S.L.U. Todos los derechos reservados.

## Introduction

Post-surgical infections or surgical site infections (SSI) constitute an important public health problem because they are associated with higher morbimortality rates and increased health expenditures for longer hospital stays and surgical procedures. Although strategies aimed at combating this problem, high infection rates are still being registered, with rates of 10% being observed in developed countries.<sup>1,2</sup> Among the most significant are infections caused by methicillin-resistant *Staphylococcus aureus* (MRSA), the causal agent of >25% of nosocomial infections,<sup>3</sup> although this rate is declining.

The literature shows that MRSA carriers are between two and nine times more likely to develop an infection after an invasive or surgical procedure, and 10 times more likely to be at risk for mortality due to a post-surgical infection.<sup>2,4</sup>

The prevalence of MRSA varies from country to country and in Spain it stands at about 30–38%.<sup>5–7</sup> However, in hospital settings its prevalence can be as high as 90% in intensive care units (ICU) and 55–83.3% in surgical services.<sup>2,7</sup> Moreover, a distinction can be made between the hospital-acquired MRSA population and the community-acquired MRSA population: 31% and 14%, respectively.<sup>8</sup>

A number of studies have demonstrated that antibiotic prophylaxis is effective in preventing SSI<sup>9,10</sup> and the most

Download English Version:

<https://daneshyari.com/en/article/1090894>

Download Persian Version:

<https://daneshyari.com/article/1090894>

[Daneshyari.com](https://daneshyari.com)