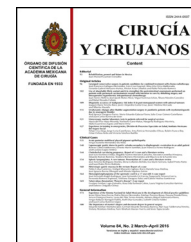




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## ORIGINAL ARTICLE

# Incidence of catheter-related infection incidence and risk factors in patients on total parenteral nutrition in a third level hospital<sup>☆</sup>

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### KEYWORDS

Total parenteral nutrition;  
Infection;  
Central venous catheter

### Abstract

**Background:** Central venous catheters are devices used for therapeutic, diagnostic, and monitoring purposes. Complications associated with central venous catheter use include those related to their insertion, rupture and displacement of the catheter, occlusion, thrombosis, and infection. Of these the latter is important due to the high morbidity and mortality it causes in the patients, and total parenteral nutrition increases the risk. The aim of this study is determine the incidence and risk factors associated with catheter-related infection in patients on parenteral nutrition.

**Material and methods:** A retrospective, observational, and cross-sectional study was conducted, by analysing patients on total parenteral nutrition who developed a catheter-related infection in a 6-month period. Multiple variables were studied, looking for significance. A statistically significant relationship was considered with a  $p < 0.05$ .

**Results:** The study consisted of 85 patients, of whom 52% were women and 48% men. The median age was 54 years. The most frequent diagnosis was enterocutaneous fistula. Catheter associated infection was present in 19% of patients. The most frequent microorganisms found were *Staphylococcus* sp. (44%) and *Candida* sp. (25%). Median time between central venous catheter insertion and infection was  $78 \pm 64$  days. There was a significance between days with a central venous catheters and infection development ( $p = 0.014$ ). Infection developed in 81% of patients on whom surgery was performed ( $p < 0.05$ ).

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**PALABRAS CLAVE**

Nutrición parenteral;  
Infección;  
Catéter venoso  
central

**Conclusion:** It was found that patients with a longer use of a central venous catheter ( $p = 0.014$ ) and those who were operated on in conjunction with total parenteral nutrition ( $p < 0.05$ ) were more prone to develop a catheter-associated infection.

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### Incidencia de infección asociada a catéter venoso central y factores de riesgo relacionados en pacientes con nutrición parenteral total en un hospital de tercer nivel

#### Resumen

**Antecedentes:** Los catéteres vasculares centrales son dispositivos que permiten el acceso al torrente sanguíneo con fines diagnósticos, terapéuticos y de monitorización. Las complicaciones por su uso incluyen las asociadas a su inserción, rotura o desplazamiento del catéter, oclusión, trombosis e infección. Esta última aumenta la morbimortalidad y el uso de nutrición parenteral aumenta el riesgo.

El objetivo de este estudio es determinar la incidencia y los factores de riesgo relacionados con infección asociada a catéter venoso central, en pacientes con nutrición parenteral total.

**Material y métodos:** Estudio retrospectivo, observacional y longitudinal. Se analizó a pacientes con nutrición parenteral que desarrollaron infección asociada a catéter, durante 6 meses. Se analizaron diversas variables en busca de significación estadística; esta se consideró con una  $p < 0.05$ .

**Resultados:** Se revisaron 85 expedientes; el 52% fueron mujeres y el 48%, hombres. La edad media fue 54 años. El diagnóstico más frecuente fue fístula enterocutánea. El 19% de los pacientes desarrolló infección. Los microorganismos más frecuentemente asociados fueron: *Staphylococcus sp.* (44%) y *Candida sp.* (25%). El promedio de días entre la colocación de catéter e infección fue  $78 \pm 64$  días. Se encontró significación estadística entre los días con catéter y el desarrollo de infección ( $p = 0.014$ ). El 81% de los pacientes que presentaron infección eran postoperados ( $p < 0.05$ ).

**Conclusión:** Encontramos que los pacientes con más días de uso de catéter central ( $p = 0.014$ ) y el hecho de estar postoperado y con nutrición parenteral ( $p = 0.05$ ) aumentan el riesgo de presentar infección asociada a catéter, por lo que debe tenerse una mayor vigilancia en estos pacientes para prevenir esta complicación.

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## Background

Central venous catheters are devices used to gain access to the bloodstream, either for diagnostic or therapeutic purposes, drug administration, total parenteral nutrition or haemodialysis. They are also an invasive cardiovascular monitoring device. It has been estimated that over 80% of hospitalised patients need an intravascular catheter, inserted either peripherally or centrally, during their hospital stay.<sup>1,2</sup> The most common approach for central venous catheters are through the subclavian, jugular or femoral vein.<sup>3</sup> Approximately 150 million catheters are inserted each year in the USA and of these 5 million are central venous catheters.<sup>4</sup>

Complications associated with central venous catheter use are common and include those associated with insertion (pneumothorax, vascular injury, cardiac arrhythmias, cardiac perforation with clogging, air embolism, nerve injury or anomalous location of the catheter), rupture or

accidental displacement of the catheter, occlusion, thrombosis and infection.<sup>5,6</sup> Of these the latter is important due to the high morbidity and mortality it causes in the patients, increasing hospital stay and consequently health-care costs.<sup>7,8</sup> The Centre for Disease Control stated there was a bloodstream infection rate in intensive care units of 4.9–11.9 cases per 1000 central venous catheters inserted within a 5-year period.<sup>9</sup> A Spanish study on the prevalence of nosocomial infections in 2010 also demonstrated that the bacteremia related to the catheter is the fourth most common nosocomial infection, with prevalence at around 2 episodes for every 100 patients with a central venous catheter.<sup>10</sup>

Bacterial colonisation of the catheter generally comes from the skin or where it comes into contact with it and is related to factors such as: the catheter material, location (higher incidence in femoral catheters), the number of lumen, time of usage and patient characteristics.<sup>11</sup> The administration of total parenteral nutrition increases

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