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CASUISTRY

Infections by carbapenemase-producing enterobacteriaceae in a department of urology. A new challenge☆

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KEYWORDS
Carbapenemase-producing enterobacteriaceae;
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Abstract

Objectives: To analyze infections by carbapenemase-producing enterobacteriaceae (CPE) and describe the characteristics and potential risk factors associated with patients of a department of urology.

Materials and methods: Observational and retrospective study. The inclusion criterion was hospitalization in our department of Urology between August 2013 and December 2016. We analyzed those patients who were positive for CPE in at least 1 culture. We reviewed their baseline characteristics, risk factors and variables such as the presence of previous urinary tract infections, subsequent readmissions, the microorganism, type of CPE, treatment, origin (hospital or community) and mortality.

Results: Of the 5657 patients who met the inclusion criterion, a CPE was isolated in 12 cases. CPE infections represented 3.6% of all healthcare-associated infections and 9.7% of those caused by enterobacteria. The analyzed factors associated with CPE infection in our series were the presence of urinary catheters (100%), undergoing surgery (58.3%), previous ICU admission (8.3%) and immunosuppression (16.6%). In terms of mortality, 8.3% of the patients who presented CPE infection died during hospitalization.

Conclusions: Approximately 10% of enterobacteria present a carbapenemase-resistance pattern in urological patients in our setting. Carrying a urinary catheter and/or undergoing surgery are risk factors associated with the development of these infections in urological patients in our setting. CPE infections increase morbidity and mortality.

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PALABRAS CLAVE
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Infecciones por enterobacterias productoras de carbapenemasas en un servicio de urología. Un nuevo desafío

Resumen

Objetivos: Analizar las infecciones por enterobacterias productoras de carbapenemasas (EPC) y describir características y posibles factores de riesgo asociados con los pacientes de un servicio de urología.

Material y métodos: Estudio observacional y retrospectivo. El criterio de inclusión fue haber estado ingresado en nuestro servicio de urología entre agosto de 2013 y diciembre de 2016. Se analizaron aquellos que presentaron positividad para EPC en al menos un cultivo. Se revisaron características basales y factores de riesgo. Asimismo se revisaron variables como presencia de infecciones urinarias previas, reingresos posteriores, el microorganismo, tipo de EPC, tratamiento administrado, un origen hospitalario o comunitario y la mortalidad.

Resultados: De los 5.657 pacientes que cumplían criterio de inclusión, en 12 casos se aisló una EPC. Las infecciones por EPC representaron un 3,6% del total de infecciones relacionadas con la asistencia sanitaria y un 9,7% de las producidas por enterobacterias. Los factores analizados asociados a infección por EPC en nuestra serie son: presencia de catéteres urinarios (100%), haber sido sometido a tratamiento quirúrgico (58,3%), ingreso previo en UCI (8,3%) e inmunosupresión (16,6%). Con relación a la mortalidad, un 8,3% de los pacientes que presentaron infección por EPC fallecieron durante el ingreso.

Conclusiones: Aproximadamente un 10% de las enterobacterias presenta patrón de resistencia a carbapenemasas en el paciente urológico de nuestro medio. Ser portador de catéter urinario y/o someterse a una cirugía son factores de riesgo asociados al desarrollo de estas infecciones en el paciente urológico de nuestro medio. La infección por una EPC eleva la morbimortalidad.

Introduction

The carbapenemase-producing enterobacteria (CPE) are a group of microorganisms capable of producing enzymes that confer protection against carbapenems. It is antibiotics with low resistance rates. For this reason, they have become the main and in many cases the only therapeutic option in multidrug-resistant situations, such as the case of CPEs.[1,2]

The appearance of multiresistant microorganisms has as its main cause the inadequate use of antibiotic therapy. The lack of indication and the treatment with suboptimal doses have contributed to their development, generating situations where the limitation of the therapeutic arsenal can lead to situations of risk to the patient's health.[3,4] Over the last years, an increase in the presence of this group of enterobacteria has been detected. This has led some groups to analyze the main risk factors (RF) associated, as well as to seek effective therapeutic strategies against these microorganisms. Among the RFs, stay in intensive care units (ICU), prolonged treatments with broad-spectrum antibiotic therapy, immunosuppression, and surgeries or invasive procedures stand out.[5] The most effective therapeutic strategies seem to be those based on combined antibiotic treatment.[3,6]

The growing number of cases and the associated high morbidity and mortality place us before a problem of great magnitude and a threat, not only for the health of the individual, but also for the health systems.[1,7]

Our objective is to analyze this type of infections in a urology department and describe the characteristics and possible RFs.

Materials and methods

We conducted an observational and retrospective study in the hospitalization area of the Urology Department of the University Hospital 12 de Octubre between August 2013 and December 2016, which includes all the admitted patients. We analyzed patients with growth, in at least one culture (urine culture, blood culture, surgical wound culture, and/or drainage culture of postoperative collections) of CPE demonstrated by antibiogram.

CPE was considered to be any enterobacteria in which the values of the minimum inhibitory concentrations of at least one carbapenem (imipenem, meropenem, doripenem, or ertapenem) were equal to or higher than the cut-off point of resistance set by EUCAST (https://www.eucast.org). The data of positivity in culture for CPE were obtained from the preventive medicine department of our center and the infection registry of our service, which allows us to determine the incidence of this type of infections in our environment.

Baseline and RF characteristics such as immunosuppression, ICU stay, recent surgery, history of previous antibiotherapy, and carrying surgical drainages and/or urinary diversion catheters were analyzed.

The presence of previous urinary tract infections (demonstrated with positive urine culture) was reviewed, understanding as such those that occurred more than 30 days before the isolation of CPE. The existence of subsequent readmissions for infections caused by CPE was evaluated with follow-up until December 2016. Finally, the cases and causes of death were reviewed.