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TITLE: A pulmonary abscess due to klebsiella pneumoniae carbapenemase - KPC 3

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Short Running Title: ABSCESS DUE TO KPC-3

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CASE REPORT
81 year-old male, with recurrent respiratory tract infections, and multiple antibiotherapy cycles in the previous 3 months, was admitted in the Emergency Department, referring fever and dyspnea for 1 week. Clinical, laboratory and imaging findings led to admission for pneumonia with respiratory failure. On the X Ray (Figure 1): “round hypotransparency, cavitated, in the right lower base”. For better characterization it was performed a chest-CT (Figure 2) that revealed: “bulky image, cavitated, with thick walls and polilobulated and heterogenous, in the right inferior lobe, measuring 66x55mm.”. It was first initiated, empirically, clindamycin, for 20 days. Nevertheless, there wasn’t improvement, and so, it was executed a bronchoscopy, allowing the isolation of klebsiella pneumoniae carbapenemase (KPC) - (clone ST 147) on the Broncho-alveolar lavage. The antibiogram showed: sensitivity to Amikacin; CIM Meropenem: ≤8 mg/L; CIM Ertapenem: <2 mg/L; CIM Colystin: ≤1,5 mg/L. He was then started on Meropenem 2 grams 3-times per day and Amikacin 500mg twice per day, for 30 days, with improvement on the chest-CT control (Figure 3), being discharged, after 97 days.

DISCUSSION
After an outbreak of KPC-3 (expressing the gene VIM-1) in our hospital, a protocol of treatment trial was implemented, being of the most value the antibiogram. Misidentification of KPC is common with standard susceptibility testing. The most easily performed confirmatory test is the modified Hodge test, which has been found to be 100% sensitive, although not specific. Definite confirmation of KPC production requires molecular methods such as PCR [1]. There is some debate concerning the appropriate dosage and the most favorable pharmacokinetic/pharmacodynamic profiles in this cases [2, 3], but unfortunately the optimal treatment is unknown. The use of aminoglycosides, polymyxin combinations and tigecycline appeared to have higher success rates. Carbapenem and polymyxin monotherapy had much lower associated success rates [4]. The literature describes a wide range of approaches, from simple conservative treatments associated with specific antibiotic therapy, to
surgical intervention, using endoscopic or percutaneous drainage [5]. Elores, a combination of Ceftriaxone, disodium edetate and sulbactam, showed high susceptibility to KPC and Extended spectrum beta-lactamase (ESBL) producing pathogens, including the ones expressing VIM-1 [6]. The reason comes for the synergic activity from the Elores combination, with reports of efficacy and safety, and its use can be considered a drug of choice for treating KPC [7]. In our case, we report a more conservative treatment, with the use of high-dose of a carbapenem associated with an amynoglicoside, for a long period, with a favorable outcome. Furthermore, in our case, Elores couldn’t be used, since disodium edetate it’s not available in our country, and the antibiogram showed resistance to ceftriaxone.

CONCLUSION

The lack of published material and the emergency of these multirresistent microorganisms it’s a challenge in the development of new treatment, control and prevention strategies. In the more serious cases of infections due to KPC, like abscesses, their adequate drainage, when possible, and the most appropriate antibiotic scheme showed a better outcome.

Keywords: KPC; Abscess; Multirresistent microorganisms; Outbreak;

CONFLICT OF INTEREST

All the authors declare there aren’t any conflicts of interests.

AUTHOR’S CONTRIBUTIONS

All the authors declare that participated in this article, and are responsible for it.

Maria Ana Canelas

Group 1- Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data;

Group 2- Drafting the article and revising it critically for important intellectual content;

Group 3- Final approval of the version to be published;
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The authors certify that this manuscript named “A pulmonary abscess due to Klebsiella pneumoniae carbapenamase KPC-3”, it’s an original article, and that all the referred facts are based on the author’s investigation.

All the staff members who were involved in the care of the patient

REFERENCES


FIGURE LEGENDS

Figure 1: Round hypotransparency, cavitated, in the right lower base

Figure 2: - (A, B) “bulky image, cavitated, with thick walls and polilobulated and heterogenous, in the right inferior lobe, measuring 66x55mm.”

Figure 3: (A, B) improvement on the chest-CT control
**FIGURES**

Figure 1: Round hypotransparency, cavitated, in the right lower base

Figure 2: (A, B) "bulky image, cavitated, with thick walls and polilobulated and heterogenous, in the right inferior lobe, measuring 66x55mm."
Figure 3: (A, B) improvement on the chest-CT control