



## Bacteremia due to *Serratia rubidaea*

Sara OUFASKA<sup>1</sup>, Hind WAHBI<sup>1</sup>, Assiya ELKETTANI<sup>1,2</sup>, Khalid ZEROUALI<sup>1,2</sup>,  
Maha SOUSSI ABDALLAOUI<sup>1,2</sup>

<sup>1</sup>Bacteriology, Virology and Hygiene Laboratory department, Ibn Rochd University Hospital of Casablanca, Morocco

<sup>2</sup>Faculty of medicine and pharmacy university of Hassan II Casablanca, Morocco

### ABSTRACT

Published Online: 01 July, 2023

**Introduction:** *Serratia rubidaea* is a gram-negative bacillus. it is an opportunistic pathogen bacterium rarely isolated in humans, usually found in the respiratory tract, bile, stools or wounds, but also in the blood.

**Case report:** 40-years-old patient followed for a currently relapsing lymphoma, hospitalized to receive a salvage treatment. The patient had an arterial catheter in place two weeks previously. Four blood cultures were positive for *S. rubidaea* within the first 48 hours. The clinical and biological evolution were favorable after the establishment of adequate antibiotic therapy according to the results of the antibiogram.

**Discussion and conclusion:** *S. rubidaea* infections are exceptional. the bacteraemic form is rarely described. This bacterium is most often isolated from the respiratory tract. Adequate antibiotic therapy after carrying out an antibiogram allowed a favorable evolution of the patient then a better support.

### KEYWORDS:

*Serratia rubidaea*,  
bacteremia

### INTRODUCTION

The Gram-negative bacterial genus *Serratia* is currently differentiated into 10 species: *S. Marcescens*, *S. Liquefaciens*, *S. Proteomaculans*, *S. Grimesii*, *S. Plymuthica*, *S. Rubidaea*, *S. Odorifera*, *S. Ficaria*, *S. Fonticola*, and *S. Entomophila* (1)(2).

*S. Marcescens* is the primary species within the *Serratia* genus associated with disease (3) but *Serratia rubidaea* is a less well-described member of the genus and is found in food, soil and water but clinical significance cannot be totally excluded because of its occurrence in clinical specimens (4).

*Serratia rubidaea* is considered as an opportunist pathogenic bacterium, it is rarely identified in man, and when so, generally found in the respiratory tract, feces, bile, wounds, but also in blood.

*S. Rubidaea* can be responsible for infection, especially in debilitated patients and particularly immunocompromised

**Corresponding Author: Sara OUFASKA**

**\*Cite this Article: Sara OUFASKA, Hind WAHBI, Assiya ELKETTANI, Khalid ZEROUALI, Maha SOUSSI ABDALLAOUI (2023). Bacteremia due to *Serratia rubidaea*. International Journal of Clinical Science and Medical Research, 3(7), 115-117**

ones, receiving broad spectrum antibiotics or after undergoing invasive procedures or extensive surgery.

### CASE REPORT

We report the case of a 40 years old woman suffering from a lymphoma stage III b since 2006. Actually, in relapse. The patient had been carrying a implantable chamber for two weeks. She was admitted to emergency room of oncology hematology department to receive her chemotherapy cure.

After receiving a saline hydration, the patient presented a hemodynamic instability with chills. The clinical examination found a patient in fairly good general condition, stable in terms of hemodynamics and respiration, without fever or an infectious center.

Paraclinical examinations were carried out in particular hemocultures on peripheral blood as well as on catheter at the time of the chills.

The patient was put on ciprofloxacin-based antibiotic therapy while awaiting laboratory results.

Four blood cultures were positive including two on peripheral blood and two others on catheter during the first 48 hours on bactec automate (BACTEC FX 40)

Furthermore, the required attitude was to complete with a fresh examination and a Gram staining showing a bacillus gram negative. The bacterium was recovered on, Mac

Conkey agar, chocolate agar and tryptic soy 5% blood agar after 24H hours of incubation at 37 ° C , as smooth large colonies, with red-pink pigment (production of a pigment called prodigiosin) and with musty pungent potato-like odor (production of alkyl-methoxypyrazine) fig.1. The organism was catalase positive and oxidase negative.

The strain was tested with API 20E SYSTEM with a biochemical profil number 1206362 (Bio Merieux, France). This profile was in agreement with a good identification of *S. Rubidaea*.

The study of the sensitivity to antibiotics of the isolated strain was determined according to the technique of diffusion in agar medium and the reading and interpretation according to the last criteria of the antibiogram committee of the French Society of Microbiology (CA-SFM): the antibiogram was as follows:

-sensitive to: Cefotaxim -ceftazidim-cotrimoxazole-gentamycin-amikacin-ciprofloxacin-imipenem  
-resistant to: ampicillin-amox ac clavulanique-cefoxitime-ertapenem

The hematologist was notified immediately to start effective antibiotic therapy according to the antibiogram, the therapeutic protocol implemented was modified and the clinical evolution of the patient was favorable.

**Discussion:** *Serratia rubidaea* is an enterobacteria whose habitat is not well known; however, it has been found in nature: vegetables, in fruits and coconut;(6) but not in water, small mammals or other animals.

Since 1940 the stain of *Serratia rubidaea* has been known under the name *Bacterium rubidaeum*. It is then classified in the genus *Serratia* by Ewing et al (5).

Its isolation as a causal agent of infection in humans is exceptional, and few cases of clinical infection have been reported. (6)

*S.rubidaea* is most often found in the respiratory tract, wounds, stools, bile, but also in the blood (7).

Ewing et al. (5) reported 17 strains of *S. Rubidaea* isolated from different clinical specimens (10 from the respiratory tract, 4 from blood, and 3 from wounds). Furthermore, some strains have occasionally been isolated, mainly from the respiratory tract, wounds or ulcers but more rarely they have been isolated in blood (5).

*S. Rubidaea* is infrequently isolated from clinical specimens, also because there is no clinical information related to these isolates, its role in human disease has been until now dubious (8).

Concerning our described case, the patient has a hematological malignancy and has suffered of bacteremia after a placement of an arterial catheter, which is a invasive procedures. This serious episode was resolved after receiving appropriate antibiotic therapy according to the antibiogram.

Because this organism is rarely isolated from the Hospital environment [9]. It is possible, therefore, that the source may be endogenous. especially when an exogenous source of infection has not been proven.

*S. Rubidaea* can cause infection, particularly in debilitated patients receiving broad-spectrum antibiotics or undergoing invasive procedures or an extensive surgery.

## CONCLUSION

*S. rubidaea* infections are exceptional the bacteraemic form is rarely described. This bacterium is most often isolated from the respiratory tract. Adequate antibiotic therapy after carrying out an antibiogram allowed a favorable evolution of the patient then a better support.

**Funding:** This article received no external funding

**Conflicts of interest:** The authors declare no conflict of interest.

## REFERENCES

1. Grimont, P. A. D., and F. Grimont. 1984. Genus VIII. *Serratia* Bizio 1823,288 Al, p. 477–484. In N. R. Krieg and J. G. Holt (ed.), *Bergey's manual of systematic bacteriology*, vol. 1. The Williams & Wilkins Co., Baltimore.
2. Grimont, P. A. D., T. A. Jackson, E. Ageron, and M. J. Noonan. 1988. *Serratia entomophila* sp. nov. associated with amber disease in the New Zealand grub *Costelytra zealandica*. *Int. J. Syst. Bacteriol.* 38:1–6.
3. Outbreaks of *Serratia marcescens* and *Serratia rubidaea* bacteremia in a central Kathmandu hospital following the 2015 earthquakes. Abhilasha Karkeya,b,c,
4. Farmer, J. J., III, B. R. Davis, F. W. Hickman-Brenner, A. McWhorter, G. P. Huntley Carter, M. A. Asbury, C. Riddle, H. G. Wathen Grady, C. Elias, G. R. Fanning, A. G. Steigerwalt, C. M. O'Hara, G. K. Morris, P. B. Smith, and D. J. Brenner. 1985. Biochemical identification of new species and biogroups of Enterobacteriaceae isolated from clinical specimens. *J. Clin. Microbiol.* 21:46–76.
5. Ewing WH, Davis BR, Fife MA, Lessel EF. Biochemical characterization of *Serratia liquefaciens* (Grimes and Hennerty) Bascomb et al. (Formerly *Enterobacter liquefaciens*) and *Serratia rubidaea* comb. Nov. and designation of type and neotype strains. *Int J Syst Bacteriol* 1973;32: 217–25.
6. D.Gentile .2016 Bacteriemia por *Serratia rubidaea* con fenotipo atípico de resistencia a quinolonas
7. Ursua PR, Unzaga MJ, Melero P, Iturburu I, Ezpeleta C, Cisterna R. *Serratia rubidaea* as an

**Sara OUFASKA et al, Bacteremia due to *Serratia rubidaea***

- invasive pathogen. J Clin Microbiol 1996;34:216–7.
8. Saito, H., L. Eting, G. P. Bodey, and P. Berkey. 1989. *Serratia* bacteremia: review of 118 cases. Rev. Infect. Dis. 11:912–920.
  9. Parment, P. A., J. Ursing, and B. Palmer. 1984. *Serratia rubidaea* isolated from a silastic foam dressing. Infection 12:268–269.

Captions to illustrations



**Fig .1 : photography on Mac Konkey agar of *S.rubidaea* colonies**