blood extravasation in petechial lesions, vacuolization of basal epidermal layers, and even intraepidermal vesicles with inflammatory infiltrate in the papillary dermis; EN is very uncommon. Cutaneous lesions in the form of a maculopapulopetechial rash with palmoplantar involvement are very characteristic of *Rickettsia conorii*, although we could not confirm the species in our patient.[4]

Rickettsiosis usually have a good prognosis, and disease tend to be limited to 10–20 days without sequelae. Complications are usually related to delays in treatment, advanced age and comorbidities. There is also a "malignant" rickettsial form of the disease characterized by multi-organic failure, especially kidney failure, disseminated intravascular coagulation with purpuric exanthema, severe hepatic injury, pulmonary infiltrates and altered consciousnes.[5,6]

The basis of diagnosis is serology, being limited by cross reactions between members of the group of spotted fevers and those of the typhus group, leading to false positive results.[6] Indirect immunofluorescence is the most sensitive and specific of all serological tests. Polymerase chain reaction (PCR) can also be performed in a eschar biopsy or blood sample and has the advantages of high specificity and being positive in the acute phase of disease.[7]

Between rickettsial species, *Rickettsia conorii* and *Rickettsia sibirica mongolitimonae* are the most frequent between May and September. *Rickettsia slovaca* and *Rickettsia rioja* are much more frequent in other times of the year and their eschars are commonly located on the scalp.[8] Although in the south of Spain the autumns are getting warmer, either *Rickettsia slovaca* or *Rickettsia rioja* could be the causative agents of our case report.

Another recently described tick-borne infection that must be included in the differential diagnosis is the one caused by 'Candidatus Neoehrlichia mikurensis'. It is transmitted by *Ixodes ricinus* ticks and it causes an inflammatory disease affecting predominantly patients with underlying diseases.[9]

Some cases of EN labeled as idiopathic might be secondary to Rickettsial infections in endemic regions.[2,3,10] Our case reports an uncommon manifestation of a relatively frequent infection in our country. Rickettsiosis could manifest just with fevers and dermatological manifestation like EN, so we suggest performing at least an initial serology and another one two weeks later in every patient presenting this dermatological sign in order to rule out an easy to treat infection.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict interest

All authors declare no conflicts of interest.

References

1. Chowaniec M, Starba A, Wiland P. Erythema nodosum – review of the literature. Reumatologia. 2016;54:79–82.
2. Schwartz RA, Nervi SJ. Erythema nodosum: a sign of systemic disease. Am Fam Physician. 2007;75:695–700.
3. Jiménez Nácher JJ, Navarro Ibáñez V, Nieto García A, Salavert Lleti M, Ferrer Tuset C, Febrer I. Rickettsia conorii: a new cause of erythema nodosum. An Med Interna. 1991;8:241–2.
4. Oteo JA, Portillo A. Tick-borne rickettsioses in Europe. Ticks Tick Borne Dis. 2012;3:271–8.
5. Baltadzhiev I, Popivanova N, Zaprianov Z. Malignant forms of Mediterranean spotted fever: risk factors for fatal outcomes. Braz J Infect Dis. 2016;20:511–2.
6. Rovery C, Raoult D. Mediterranean spotted fever. Infect Dis Clin North Am. 2008;22:515–30.
7. Leitner M, Yitzhaki S, Rzotkiewicz S, Keysary A. Polymerase chain reaction-based diagnosis of Mediterranean spotted fever in serum and tissue samples. Am J Trop Med Hyg. 2002;67 Suppl.:166–9.
8. Portillo A, Santibáñez S, García-Álvarez L, Palomar AM, Oteo JA. Rickettsioses in Europe. Microbes Infect. 2015;17:834–8.
9. Portillo A, Santibáñez P, Palomar AM, Santibáñez S, Oteo JA. 'Candidatus Neoehrlichia mikurensis' in Europe. New Microbes New Infect. 2018;22:30–6.
10. Johnston RB. Panniculitis. In: Weedon's skin pathology essentials. Elsevier; 2017. p. 349–68.

José Antonio Peregrina-Rivas[a], Emilio Guirao-Arrabal[b,*], Francisco Manuel Ramos-Pleguezuelos[c], José Hernández-Quero[b]

[a] *Unidad de Medicina Interna, Hospital Universitario San Cecilio, Granada, Spain*
[b] *Unidad de Enfermedades Infecciosas, Hospital Universitario San Cecilio, Granada, Spain*
[c] *Unidad de Anatomía Patológica, Hospital Universitario San Cecilio, Granada, Spain*

* Corresponding author.
E-mail address: emilio.guirao@gmail.com (E. Guirao-Arrabal).

https://doi.org/10.1016/j.eimc.2021.01.010

Low sensitivity of rapid antigenic tests as a screening method in an outbreak of SARS-CoV-2 infection in prison☆

Baja sensibilidad de los test rápidos antigénicos como método de cribado en un brote de infección por SARS-CoV-2 en prisión

Dear Editor,

At present, the gold standard for the diagnosis of SARS-CoV-2 infection is detection of viral RNA by means of real-time polymerase chain reaction (rt-PCR) testing or an equivalent molecular technique. In Spain, rapid antigen testing (RAT) that is duly validated (sensitivity ≥80% and specificity ≥97%) can be used within five days of the onset of symptoms in patients with no major immunosuppression and no criteria for intensive care unit (ICU) admission[1]. RAT is less sensitive than rt-PCR testing in all stages of the infection, and even less so in asymptomatic cases, but its use in the absence of symptoms has not been ruled out in all cases[1–3]. A recent report from the European Centre for Disease Prevention and Control (ECDC) recommends the use of RAT in patients with or without symptoms if a rate of positive tests ≥10% is anticipated[2]. It also advises its use in high-risk settings to quickly identify infected individuals and implement prevention and control measures to curb transmission, though it does recommend that negative cases be confirmed with rt-PCR testing[1–3].

We report the results of the use of RAT in a SARS-CoV-2 outbreak that occurred on a residential unit (RU) of Figueras prison in Girona, Spain, in late 2020. Between 23 and 25 December, SARS-

☆ Please cite this article as: Marco A, Solé C, Abdo IJ, Turu E. Baja sensibilidad de los test rápidos antigénicos como método de cribado en un brote de infección por SARS-CoV-2 en prisión. Enferm Infecc Microbiol Clin. 2022;40:152–154.

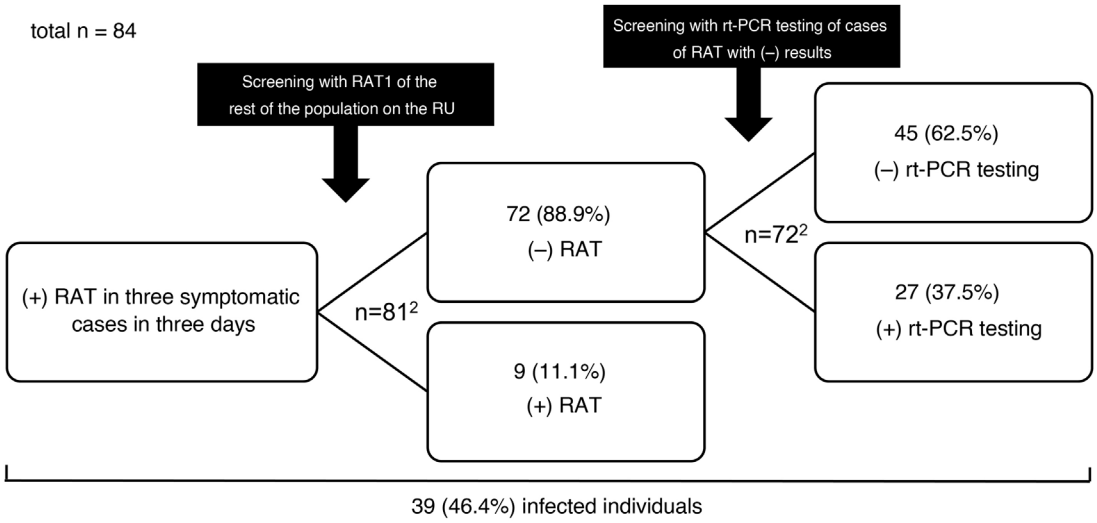

Fig. 1. Screening and results obtained in the outbreak on the residential unit in Figueras prison.

CoV-2 infection was diagnosed by RAT (Panbio™ COVID-19 Ag tests, Abbott) in three inmates with mild respiratory symptoms. The RU was isolated, and on the afternoon of 25 December the rest of the population was screened with RAT (n = 81). Nine inmates (11.1%) tested positive. They were separated from the others, isolation measures were kept in place and the RU was considered a low-complexity COVID unit given the number of asymptomatic and mildly symptomatic cases with no criteria for hospital admission. The unit was equipped with organisational and functional resources to ensure care safety, quality and efficiency. Cleaning, laundry, waste management and distribution of food and medication was organised according to the recommendations of the Catalan Health Department[4]. The following were indicated: a) strict isolation of the unit with essential healthcare and non-healthcare personnel entering and exiting; b) mandatory use of personal protective equipment (PPE); and c) clinical examinations (oxygen saturation, temperature and questions about the possible onset of symptoms) twice daily.

On 28 December, rt-PCR testing was performed in the 72 cases with previously negative RAT, yielding positive results in 27 (37.5%) of them (Fig. 1). All followed a good clinical course and there were no hospital admissions.

The prevalence of infection (46.4%) was high as the outbreak occurred in an enclosed space. In situations of confinement, it is estimated that the contagion rate (R0: mean number of people infected by an infected person) may be five to 14 times higher than usual (normally, 1.5–3.0)[5]; this explains the high number of infections detected in the outbreak. The measures adopted were satisfactory and rt-PCR testing results were negative in all contacts at seven and 14 days.

Regarding the use of RAT in asymptomatic close contacts, some studies (an original[6], a letter to the editor[7] and several preprints[8–10]) have shown it to have a specificity equal or close to 100%[7–10], but a much lower sensitivity, between 33% and 66%[6–10]. None of these studies was conducted in contacts from an outbreak or in confined groups. In the cases on the RU, the sensitivity was 25% and the negative predictive value, a key indicator in scenarios in which the prevalence can be considered moderate or high, was 63%. Although RAT is appealing as it is a quick and easy technique that does not require qualified operators, the risk of false negatives is high, even in an outbreak in a confined space with a high prevalence of positive results such as the one reported. Consequently, rt-PCR testing should be the test of choice in screening asymptomatic patients. Only if rt-PCR test results cannot be obtained quickly and there is a high risk of transmission could initial screening with RAT be advisable. In those cases, negative results should be confirmed with subsequent rt-PCR testing, as can be deduced from this study and as is suggested by the guidelines and protocols from the Spanish Ministry of Health[1], the ECDC[2] and the United States Centers for Disease Control and Prevention (CDC)[3].

Funding

The authors declare that they received no funding to conduct this study.

References

1. Estrategia de detección precoz, vigilancia y control de COVID-19. Centro de Coordinación de Alertas y Emergencias Sanitarias. Ministerio de Sanidad. Actualizado a 18 de diciembre de 2020 [accessed 2 Jan 2021]. Available from: https://www.mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov/documentos/COVID19_Estrategia_vigilancia_y_control_e_indicadores.
2. European Centre for Disease Prevention and Control: Options for the use of rapid antigen tests for COVID-19 in the EU/EEA and the UK; 19 November 2020 [accessed 3 Jan 2021]. Available from: https://www.ecdc.europa.eu/en/publications-data/options-use-rapid-antigen-tests-covid-19-eueea-and-uk.
3. Centers for Disease Control and Prevention (CDC). Interim Guidance for Antigen Testing for SARS-CoV-2. Update Dec. 16, 2020 [accessed 4 Jan 2021]. Available from: Interim Guidance for Antigen Testing for SARS-CoV-2 | CDC.
4. Servei Català de la Salut. Guia d'actuació enfront de casos d'infecció pel nou coronavirus SARS-CoV-2 a les residencies [accessed 3 Jan 2021]. Available from: https://canalsalut.gencat.cat/web/.content/_A-Z/C/coronavirus-2019-ncov/material-divulgatiu/guia-actuacio-residencies.pdf.
5. Dietz L, Horve PF, Coil DA, Fretz M, Eisen JA, Van den Wymelenberg K. 2019 novel coronavirus (COVID-19) pandemic: built environment considerations to reduce transmission. mSystems. 2020;5:e00375–420, http://dx.doi.org/10.1128/mSystems.00245-20.
6. Linares M, Pérez-Tanoira R, Carrero A, Romanyk J, Pérez-García F, Gómez-Herruz P, et al. Panbio antigen rapid test is reliable to diagnose SARS-CoV-2 infection in the first 7 days after the onset of symptoms. J Clin Virol. 2020;133:104659, http://dx.doi.org/10.1016/j.jcv.2020.104659.
7. Fenollar F, Bouam A, Ballouche M, Fuster L, Prudent E, Colson P, et al. Evaluation of the Panbio Covid-19 rapid antigen detection test device for the screening of 2 patients with Covid-19. J Clin Microbiol. 2020, http://dx.doi.org/10.1128/JCM.02589-20.
8. Masiá M, Fernández-González M, Sánchez M, Carvajal M, García JA, Gonzalo N, et al. Nasopharyngeal Panbio COVID-19 antigen performed at point-of-care has a high sensitivity in symptomatic and asymptomatic

patients with higher risk for transmission and older age. medRxiv. 2020, http://dx.doi.org/10.1101/2020.11.16.20230003.
9. Torres I, Poujois S, Albert E, Colomina J, Navarro D. Real-life evaluation of a rapid antigen test (Panbio™ COVID-19 Ag Rapid Test Device) for SARS-CoV-2 detection in asymptomatic close contacts of COVID-19 patients. medRxiv. 2020, http://dx.doi.org/10.1101/2020.12.01.20241562.
10. Builete O, Lorente P, Leiva A, Carandell E, Oliver A, Rojo E, et al. Evaluation of the Panbio™ rapid antigen test for SARS-CoV-2 in primary health care centers and test sites. medRxiv. 2020, http://dx.doi.org/10.1101/2020.11.13.20231316.

Andrés Marco[a,b,*], Concepció Solé[c], Indiana J. Abdo[c], Elisabet Turu[a]

[a] *Programa de Salud Penitenciaria, Instituto Catalán de la Salud, Barcelona, Spain*
[b] *CIBER Epidemiologia y Salud Pública (CIBERESP), Madrid, Spain*
[c] *Equipo de Atención Primaria Penitenciaria, Figueres, Girona, Spain*

* Corresponding author.
E-mail address: amarco@gencat.cat (A. Marco).

https://doi.org/10.1016/j.eimce.2021.12.002