Fig. 1. *Alistipes finegoldii* in pure culture on blood agar in anaerobiosis. Typical raised, circular, opaque colonies can be observed.

with peritonitis[6,7]. In our case, the bacteraemia occurred as a consequence of peritonitis due to intestinal perforation, so the source of infection could possibly be due to intestinal alteration. The presence of this microorganism has been implicated in certain diseases, such as tumour pathology[3,6]. However, larger studies are needed to confirm this relationship.

The routine use of MALDI-TOF MS in clinical microbiology laboratories has greatly improved the identification of microorganisms, especially anaerobes. In addition, it is enabling the identification of new species which hitherto have not been related to human pathology, since phenotypic identification of them is difficult[8]. Species identification is highly likely when the *log score* is ≥2.0[8], but it must be confirmed when it falls below that *cut-off* by means of other techniques, such as 16S rRNA gene sequencing. Moreover, it is advisable when the microorganism identified rarely produces infectious pathology, as in our case.

Regarding treatment, the need to apply antibiotic bitherapy with piperacillin-tazobactam and metronidazole to avoid treatment failures due to the production of β-lactamases by some Gram-negative anaerobes should be highlighted, as well as adequate control of the focus of surgical infection to avoid sequelae and complications.

In conclusion, this is the third isolation of *A. finegoldii* as a cause of isolated bacteraemia in pure culture, and it indicates that this pathogen may be responsible for serious infections.

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Conflicts of interest

The authors have no conflicts of interest to declare.

Bibliografía

1. Rautio M, Lönnroth M, Saxén H, Nikku R, Väisänen ML, Finegold SM, et al. Characteristics of an unusual anaerobic pigmented Gram-negative rod isolated from normal and inflamed appendices. Clin Infect Dis. 1997;25 Suppl 2:S107–10.
2. Rautio M, Eerola E, Väisänen-Tunkelrott ML, Molitoris D, Lawson P, Collins MD, et al. Reclassification of *Bacteroides putredinis* (Weinberg et al., 1937) in a new genus *Alistipes* gen. nov., as *Alistipes putredinis* comb. nov., and description of *Alistipes finegoldii* sp. nov., from human sources. System Appl Microbiol. 2003;26:182–8.
3. Parker BJ, Wearsch PA, Veloo ACM, Rodríguez-Palacios A. The genus *Alistipes*: gut bacteria with emerging implications to inflammation, cancer, and mental health. Front Immunol. 2020;11:906.
4. Klindworth A, Pruesse E, Schweer T, Peplies J, Quast C, Horn M, et al. Evaluation of general 16S ribosomal RNA gene PCR primers for classical and next-generation sequencing-based diversity studies. Nucleic Acids Res. 2013;41(1):e1.
5. European Committee on Antimicrobial Susceptibility Testing. Breakpoint tables for interpretation of MICs and zone diameters. Version 12.0, 2022. http://eucast.org.
6. Fenner L, Roux V, Ananian P, Raoult D. *Alistipes finegoldii* in blood cultures from colon cancer patients. Emerg Infect Dis. 2007;13:1260–2.
7. Minguela JI, Aurrekoetxea B, Ferro M. Peritonitis due to *Alistipes finegoldii* in a patient on peritoneal dialysis. Ther Apher Dial. 2021;25:1014–6.
8. Nagy E, Becker S, Kostrzewa M, Barta N, Urbán E. The value of MALDI-TOF MS for the identification of clinically relevant anaerobic bacteria in routine laboratories. J Med Microbiol. 2012;61:1393–400.

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First reported case of imported scrub typhus in Spain: A disease to consider in travellers

Primer caso descrito de tifus de los matorrales en España: una enfermedad a considerar en los viajeros

Dear Editor,

Scrub typhus (ST) is an arthropod-borne disease caused by *Orientia tsutsugamushi*. It is endemic throughout the "tsutsugamushi triangle", which stretches from northern Japan to northern Australia, and to Pakistan and Afghanistan.[1] However, autochthonous cases of Chile suggest the existence of an endemic focus in South America.[2]

Due to the increase in international travellers, multiple imported cases have been reported in non-endemic regions. In Europe, Costa et al.[3] collected 40 patients since 1986. However, to our knowledge, no scrub typhus cases from travellers returning to Spain have been published. Herein, we report a PCR-confirmed-case of a patient diagnosed of ST.

In November 2021, a 51-year-old Chinese male attended the Emergency Department of Hospital 12 de Octubre (Madrid, Spain) suffering four-days-fever up to 39 °C and retroocular headache. The patient had no remarkable medical records and he had returned

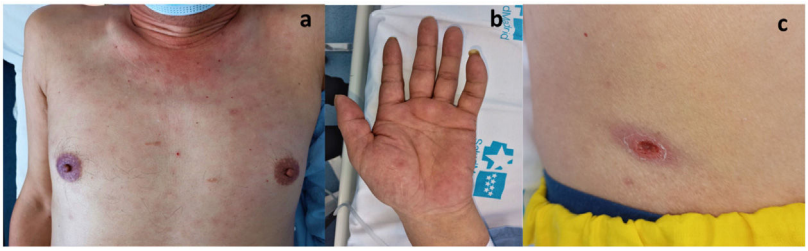

Fig. 1. On physical examination the patient presented (a) maculopapular rash affecting trunk (b) palmar involvement (c) a crust over a well-delimited ulcer compatible with a black eschar.

3 days before, from a one-month trip in a rural area of Haian (in Jiangsu, 200 km from Shanghai) where he had been working in rice fields.

Laboratory tests revealed increased transaminases, especially cholestatic enzymes, and C-reactive protein. A chest X-ray showed mediastinal lymphadenopathy. Abdominal ultrasound showed slight thickening of the gallbladder. Antibiotic therapy was initiated under suspicion of acute cholangitis (Fig. 1).

Two days later, the patient developed a maculopapular rash with palmar involvement. On physical examination, he presented a necrotic crust over a well-delimited ulcer compatible with a black eschar. Suspecting a rickettsia infection, we started empirical treatment with doxycycline.

Serology for *R. conorii* (the only one available in our hospital) was negative. Polymerase chain reaction (PCR) assay targeting 56-kDa type-specific antigen gene (TSA56) from an eschar swab sample was performed at the Center of Rickettsiosis and Arthropod-Borne Diseases (Logroño, Spain). Nucleotide sequence analysis showed the presence of *O. tsutsugamushi*. Hence, the patient was diagnosed with ST. After treatment with doxycycline, skin lesions rapidly improved and liver enzymes normalized.

O. tsutsugamushi is transmitted to humans by the bite of larval stages of trombiculid mites.[1] The infection begins at the bite-site with a papule that becomes an eschar (observed in 60–100% of patients). After 10–12 days of incubation, high fever, headache and arthromyalgias begin. The maculopapular rash affecting the trunk and limbs usually appears around the fifth day. Cutaneous manifestations are frequently the key for suspicion of this disease. Liver disorders may be found, mainly increased levels of AST and ALT, though cholangitis has been described as a possible manifestation of scrub thypus.[4] Polyadenopathies are often present in these patients. Jeong et al.[5] published a review about the radiological manifestations, observing gallbladder wall thickening and mediastinal lymphadenopathy in 47% and 91% of patients, respectively. In severe cases, encephalitis, cardiomyopathy, and interstitial pneumonia develop, and without proper treatment, the disease can progress to death.

Classical manifestations are not always present, Nachega et al.[6] described lower frequency of rash and black eschar in travellers compared to local cases, which can be explained by differences in host immunity, geographical differences in disease epidemiology, or investigators' clinical diagnostic skills.

Diagnosis can be made by serological studies. However, low antibody titres are common in the first 4–5 days of illness and for confirmation a posterior seroconvertion or seroreinforcement is required. In addition, the potential cross-reactions with other rickettsiae are described. PCR on eschar biopsies has demonstrated high sensitivity in the early stages of the disease and like in other diseases produced by ricketsiae that present an eschar, a swab eschar also has shown high sensitivity using molecular tools.[7]

The treatment of choice is doxycycline twice daily for 3–7 days and it should be started as soon as the diagnosis is suspected.[6]

We report the first case of imported scrub typhus in Spain to our knowledge. In the series reported by Costa et al.[3] there is not a single case imported from China despite being included in the "tsutsugamushi triangle".

Prior to the 1980s, cases of ST were observed mainly in the south of Yangtze River regions. However, over the past decade, ST prevalence has increased in several areas of China that can be divided into three distinct regions, namely North (Anhui, Jiangsu, Shandong), Southwest (Yunnan, Sichuan), and South (Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Zhejiang).[8]

The greater knowledge of other diseases produced by rickettsiae and initially described in other regions of Europe, Asia or Africa, such as Dermacentor-borne necrotic erythema and lymphadenopathy (*R. slovaka*), lymphangitis-associated rickettsiosis (*R. sibirica* subsp. *Mongolitimonae*) or African tick bite fever (*R. africae*),[9,10] has allowed us to improve our ability to diagnosis these conditions in our country. Therefore, we consider necessary to highlight the importance of suspecting this disease in patients who come from endemic areas. Although it is something exceptional, it will be increasingly likely to find cases like this in the future, and an early diagnosis will let start an empirical treatment and avoid more serious and even fatal cases.[1]

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Conflict of interest

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Bibliografía

1. Seong SY, Choi MS, Kim IS. Orientia tsutsugamushi infection: overview and immune responses. Microbes Infect. 2001;3:11–21.
2. Weitzel T, Dittrich S, López J, Phuklia W, Martinez-Valdebenito C, Velásquez K, et al. Endemic scrub typhus in South America. N Engl J Med. 2016;375:954–61.
3. Costa C, Ferrari A, Binazzi R, Beltrame A, Tacconi D, Moro L, et al. Imported scrub typhus in Europe: report of three cases and a literature review. Travel Med Infect Dis. 2021;42:102062.
4. Lee KH, Heo ST, Jeong SU, Kim MY, Jeong WS, Hyun CL, et al. Acute cholangitis caused by boryong strain of Orientia tsutsugamushi. Infect Chemother. 2020;52:621–5.
5. Jeong YJ, Kim S, Wook YD, Lee JW, Kim KI, Lee SH. Scrub typhus: clinical, pathologic, and imaging findings. Radiographics. 2007;27:161–72.
6. Nachega JB, Bottieau E, Zech F, Van Gompel A. Travel-acquired scrub typhus: emphasis on the differential diagnosis, treatment, and prevention strategies. J Travel Med. 2007;14:352–5.
7. Faccini-Martínez ÁA, García-Álvarez L, Hidalgo M, Oteo JA. Syndromic classification of rickettsioses: an approach for clinical practice. Int J Infect Dis. 2014;28:126–39.
8. Musa TH, Ahmad T, Wana MN, Li W, Musa HH, Sharun K, et al. The epidemiology, diagnosis and management of scrub typhus disease in China. Hum Vaccin Immunother. 2021;17:3795–805.
9. Parola P, Paddock CD, Raoult D. Tick-borne rickettsioses around the world: emerging diseases challenging old concepts. Clin Microbiol Rev. 2005;18:719–56.

10. Ramos JM, Jado I, Padilla S, Masia M, Anda P, Gutierrez F. Human infection with Rickettsia sibirica mongolitimonae, Spain, 2007. Emerg Infect Dis. 2013;19:267–9.

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Klebsiella pneumoniae hipervirulenta ST66 como causa de neumonía necrosante

ST66 Hypervirulent Klebsiella pneumoniae *as a cause of necrotizing pneumonia*

Caso

Varón de 41 años sin antecedentes médicos de interés que acudió a urgencias por cuadro febril y disnea basal de 24 h de evolución, junto con expectoración hemoptoica. Durante el mes previo a este episodio había estado en tratamiento con distintos AINE, diazepam (5 mg/24 h por vía oral) y dexametasona (4 mg/12 h por vía oral) debido a lumbociatalgia moderada de curso subagudo. A su llegada, el paciente presentaba eritrodermia generalizada y cianosis acra. Además, presentaba dificultad respiratoria con tiraje toracoabdominal y taquipnea (32 rpm). Dada la situación de gravedad clínica, el paciente fue llevado al área de reanimación. Se inició oxigenoterapia de alto flujo, pero se procedió a intubación por mala oxigenación. Se produjo un rápido deterioro clínico con shock séptico y fracaso multiorgánico con fracaso renal: urea = 73 mg/dL (< 40 mg/dL) y creatinina = 2,68 mg/dL (0,6-1,1 mg/dL); leucopenia = 2,18*10$\hat{3}$/μL [3,5-11*10^3/uL]; trombocitopenia = 104*10$\hat{3}$/μL (150.000-400.000 uL) y alteraciones de la coagulación (tiempo de protrombina = 33% [70-100%]; INR = 2,3 [0,8-1,2]; dímero D: 3.400 ng/mL [< 100 ng/mL]). Además, se evidenció una insuficiencia respiratoria global con pO2 de 61 mm Hg (75-100 mm Hg) y pCO2 de 61 mm Hg (23-29 mmol/L). Se realizó angio-TC torácica en la que se mostraba neumonía necrosante (fig. 1). Se inició cobertura antibiótica por vía intravenosa de amplio de espectro con meropenem (1 g/8 h), teicoplanina (400 mg/12 h), clindamicina (900 mg/8 h) y caspofungina (70 mg/día).

Se trasladó al paciente a otro centro para oxigenación de membrana extracorpórea dada la mala situación respiratoria. El paciente se estabilizó, pero varios días después se produjo una elevación de bilirrubina (4,8 mg/dL [0,1-1-2 mg/dL]) y lactato deshidrogenasa (1000 U/L [140-280 U/L]) respecto a analíticas previas. Se realizó ecografía abdominopélvica con hallazgos sugestivos de colecistitis aguda alitiásica, realizándose colecistectomía percutánea guiada por ecografía. Tras retirada del drenaje, el paciente sufrió hemoperitoneo masivo por perforación de arteria mamaria izquierda y epigástrica inferior con embolización efectiva posterior. Finalmente, tras 2 meses hospitalizado fue dado de alta.

Microbiología

Se recogieron muestras de hemocultivo, broncoaspirado y aspirado traqueal. La muestra de aspirado traqueal se utilizó para realizar el panel de neumonía del sistema Filmarray® (BioFire Diagnostics, Salt Lake City, UT, Estados Unidos) con identificación de *Klebsiella pneumoniae (K. pneumoniae)*. En ambas muestras respiratorias se aisló *K. pneumoniae* de aspecto mucoso con «String test» positivo (> 5 mm; ver material suplementario) y tras estudiar la sensibilidad antibiótica mediante el panel ID/NMIC 503 BD™ Phoenix (Becton Dickinson, Franklin Lakes, NJ, Estados Unidos) solo presentaba resistencia (intrínseca) a ampicilina (CMI en material suplementario). Se realizaron pruebas complementarias (fenotípicas) para confirmar la susceptibilidad antibiótica y la ausencia de mecanismo de resistencia (betalactamasas de espectro extendido, AmpC, KPC, metalobetalactamasas u OXA-48). Para ello, se emplearon los kits de «KPC/Metallo-beta-lactamase and OXA-48 Confirm Kit» y «Total ESBL, AmpC and ESBL + AmpC Confirm kit» de ROSCO Diagnostica (ROSCO Diagnostica A/S, Taastrupgaardsvej 30, DK-2630 Taastrup, Dinamarca). Se confirmó que la cepa no presentaba betalactamasas de espectro extendido, AmpC o carbapenemasas (material suplementario). Una muestra de bilis es enviada para cultivo tras colecistectomía percutánea, pero no hay crecimiento de ningún microorganismo.

Se envió la cepa aislada en la muestra del aspirado traqueal al «Centro Nacional de Microbiología» (Instituto de Salud Carlos III). Se realizó secuenciación genómica completa, que confirmó la ausencia de mecanismos de resistencia mediante su caracterización genotípica. Además, se pudo conocer que la cepa pertenecía al serotipo capsular K2 y MLST 66 (tipificación multilocus de secuencias que permite una caracterización taxonómica, útil en epidemiología molecular para filiación de brotes). La cepa poseía otros genes de virulencia característicos como rmpA, localizados en plásmidos (regulador del fenotipo mucoide A, responsable de la hipermucoviscosidad de la cepa), Iuc2 (aerobactina, sideróforo), clb1 (colibactina, endotoxina) y ybt12 (yersinabactina, sideróforo). Además, se encontró también que poseía un elemento conjugado integrado denominado ICEKp10, que se comporta como elemento genético móvil que porta el locus clb y se asocia con algunos linajes del sideróforo yersinabactina, entre los que se encuentra ybt12. Mediante el análisis llevado a cabo con PlasmidID se detecta un plásmido de unos 160.000 bp que pertenece al grupo de incompatibilidad IncFIB[1] (con un porcentaje de similitud y cobertura superiores al 99%, con respecto al plásmido LR792629.1). Los siguientes factores de virulencia rmpA (regulador de la síntesis de polisacárido capsular asociado al fenotipo mucoide) e Iuc2 (aerobactina).

Discusión

Klebsiella pneumoniae hipervirulenta (hvKp) presenta mayor virulencia que las cepas clásicas de *K. pneumoniae* (cKp). Se describió por primera vez a mediados de 1980 en Asia, donde actualmente se considera una enfermedad endémica[2].

En hvKp, la hiperproducción de polisacárido capsular (CPS) es el factor de virulencia más importante, que les confiere esa propiedad de hipermucoviscosisdad. Su variabilidad ha permitido clasificar las cepas de *K. pneumoniae* en más de 77 serotipos capsulares distin-