Facklamia Species and Streptococcus pneumoniae Meningitis: A Case Report and Review of the Literature

Kesav C. Parvataneni, Sugantha Iyer, Riad Khatib, and Louis D. Saravolatz
St. John Hospital and Medical Center and Wayne State University School of Medicine, Detroit, Michigan

Facklamia sp are Gram-positive cocci that are often mistaken for viridans streptococci, but they rarely cause invasive disease. In this report, we describe a case of mixed Facklamia sp and Streptococcus pneumoniae meningitis in an immunocompetent host with sinusitis. This case demonstrates that Facklamia sp may be part of normal human flora but can be associated with invasive disease.

Keywords. Facklamia species; meningitis; review of the literature.

Facklamia species are part of the normal female genital tract flora [1]. They have been implicated in genitourinary disease [1]. In previous studies, a small number of invasive infections have been described such as urinary tract infections, chorioamnionitis, and infective endocarditis [1,2]. Our study represents a case of acute bacterial meningitis due to Facklamia spp and Streptococcus pneumoniae coinfection.

CASE REPORT

A 41-year-old female presented with a 3-day history of nasal congestion and fevers. She has a past medical history of recurrent sinusitis and she has no history of immunocompromising conditions. She subsequently developed headaches, lethargy, and gait instability. She had no known sick contacts or recent travel. On admission, she was febrile at 101.5°F, somnolent, and had nuchal rigidity.

A lumbar puncture was performed and cerebrospinal fluid (CSF) analysis revealed a white blood count of 713/mm³ (95% polymorphonuclear), a protein level of 253 mg/L, and a glucose level of 15 mg/L. Gram stain showed Gram-positive, lancet-shaped diplococci and smaller rounded cocci.

A computed tomography scan showed bilateral ethmoid and left maxillary sinusitis (Figure 1). The patient was treated with vancomycin, ceftriaxone, and dexamethasone. The patient’s blood cultures grew S pneumoniae. In addition, the patient’s cerebrospinal fluid culture grew Facklamia species. Due to the blood and CSF culture discordance, both were resubcultured. Re-examination of the blood culture bottle grew S pneumoniae alone, whereas CSF reculture revealed 2 colony morphologies, which were identified as S pneumoniae and Facklamia species (Figure 2). Human immunodeficiency virus testing was negative. Both S pneumoniae and Facklamia species were susceptible to ceftriaxone with a minimum inhibitory concentration of 0.125 mcg/mL; therefore, vancomycin was discontinued.

The patient’s mentation gradually improved over the next few days, and she returned to her baseline functional status. The patient was discharged to complete a 14-day course of intravenous ceftriaxone.

DISCUSSION

Facklamia species was first discovered by Collins et al [3–7] in 1997. There are now 6 species described in the literature: Facklamia hominis, Facklamia ignava, Facklamia sourektii, Facklamia languid, Facklamia tabaci salis sp nov, and Facklamia miroungae sp nov. All of
the Facklamia species have been isolated from human clinical specimens with the exception of F tabaciasalis, which was isolated from a tobacco sample, and F miroungae, which was isolated from a southern elephant seal [3, 7]. These Facklamia species are Gram-positive cocci found as short chains or diplococci, and they are often mistaken for viridans streptococci [8]. Facklamia species is a weakly alpha hemolytic, facultative anaerobe that is catalase and oxidase negative, and it grows best at 37°C [1]. Likewise, viridans streptococci are alpha or nonhemolytic, anaerobic, catalase and oxidase negative, growing at 35–37°C [9]. A key difference between the 2 organisms is Facklamia species are positive for pyrrolidonyl arylamidase (PYR)/PYR-aminopeptidase, whereas this enzymes activity is negative in Streptococcus viridans. This difference is typically used to differentiate enterococci and Streptococcus pyogenes (positive) from S viridans (negative). To reliably distinguish Facklamia species from S viridans, 16S rRNA gene sequence analysis should be performed, but it may not be available due to cost and complexity of this testing. The identification of these bacteria could be problematic because few of the rapid testing systems currently include them in their databases, such as the matrix-assisted laser desorption ionization time-of-flight mass spectrometry [8]. Our case was identified by the Vitek 2-automated biochemical microbiology system. It uses a Gram-positive colorimetric reagent card with 64 test substrates. The unique properties of Facklamia species that allowed it to be identified by the system included positivity for L-PYR and growth in 6.5% NaCl. This result was confirmed by manual PYR/PYR-aminopeptidase retesting.

In a previous study examining 120 strains of unidentified Gram-positive cocci with phenotypic characteristics that eliminated them from the known genera of bacteria, such as Aerococcus, Streptococcus, Enterococcus, and Lactococcus, 18 strains (21.6%) of bacteria were identified as Facklamia species [1]. These facultative anerobes were included in a group of previously unidentified Gram-positive cocci because they had an unusual combination of positive reactions that included only leucine aminopeptidase, L-pyrrolidinyl-β-naphthylamide, and growth in 6.5% sodium chloride for genus identification [10].

In 1 case review series, Facklamia species were isolated from 24 clinical specimens of human origin: 13 from blood cultures, 4 from vaginal specimens, 1 each from urine, CSF, bone, an abscess, a boil, the gall bladder, and the source was not stated in 1 case [1]. Only a handful of human infections have been described, and one contained a positive CSF culture with a limited clinical description [1]. Nineteen of 20 specimens from human cases with adequate information were from females [1]. Thus, the natural habitat in humans has been speculated to lie in the female genital tract [1].

CONCLUSIONS

The pathogenic potential of Facklamia species is unclear in this case. However, we know this organism has been implicated in invasive infections and isolated from the blood, bone, gallbladder, and CSF of patients [1]. It also is reasonable to conclude that Facklamia species may have translocated into the CSF by following S pneumoniae, and all of this patient’s symptoms could be attributed to meningitis induced by infection with S pneumoniae alone. This case highlights Facklamia species as an organism recovered from the CSF in association with an established pathogen, S pneumoniae. It is important to distinguish Facklamia species from other Gram-positive cocci so that the true pathogenic potential of this organism can be determined.

Acknowledgments

Potential conflicts of interest. All authors: No reported conflicts. All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest.
References

1. LaClaire L, Facklam R. Antimicrobial susceptibilities and clinical sources of Facklamia species. Antimicrob Agents Chemother 2000; 44:2130–2.
2. Healy B, Beukenholt RW, Tuthill D, et al. Facklamia hominis causing chorioamnionitis and puerperal bacteraemia. J Infect 2005; 50:353–5.
3. Collins MD, Hutson RA, Falsen E, et al. Facklamia tabacinasalis sp. nov., from powdered tobacco. Int J Syst Bacteriol 1999; 49:1247–50.
4. Collins MD, Lawson PA, Monasterio R, et al. Facklamia ignava sp. nov., isolated from human clinical specimens. J Clin Microbiol 1998; 36:2146–8.
5. Collins MD, Hutson RA, Falsen E, et al. Facklamia sourekii sp. nov., isolated from human sources. Int J Syst Bacteriol 1999; 49:635–8.
6. Lawson PA, Collins MD, Falsen E, et al. Facklamia languida sp. nov., isolated from human clinical specimens. J Clin Microbiol 1999; 37: 1161–4.
7. Hoyles L, Foster G, Falsen E, et al. Facklamia miroungae sp. nov., from a juvenile southern elephant seal (Mirounga leonina). Int J Syst Evol Microbiol 2001; 51:1401–3.
8. Dubois D, Segonds C, Prere MF, et al. Identification of clinical Streptococcus pneumoniae isolates among other alpha and nonhemolytic streptococci by use of the Vitek MS matrix-assisted laser desorption ionization-time of flight mass spectrometry system. J Clin Microbiol 2013; 51:1861–7.
9. Collins MD, Falsen E, Lemozy J, et al. Phenotypic and phylogenetic characterization of some Globicatella-like organisms from human sources: description of Facklamia hominis Gen. Nov., Sp. Nov. Int J Syst Bacteriol 1997; 47:880–2.
10. Facklam R, Elliott JA. Identification, classification, and clinical relevance of catalase-negative, gram-positive cocci, excluding the streptococci and enterococci. Clin Microbiol Rev 1995; 8:479–95.