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The extending spectrum of human infection cause by Sphingomonas paucimobilis in paediatric population

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ABSTRACT

Sphingomonas paucimobilis is a Gram-negative bacillus that does not ferment glucose and is found in both the natural environment and hospitals. Although Sphingomonas paucimobilis, a non-fermenting Gram-negative bacillus, is considered to be of minimal clinical importance, there are several reports of infections with this organism in the literature. Because of the bacteria's low virulence nature, no mortality have been associated to S.paucimobilis infections.

INTRODUCTION

There are currently more than 30 species in the Sphingomonas sensu stricto genus, with only Sphingomonas paucimobilis having clinical importance [(1)]. With more studies, it indicates that it should not be underestimated as a probable source of pathogenic bacteria, and that it should be considered for inclusion in routine infectious pathogen tests. Sphingomonas paucimobilis (previously known as Pseudomonas paucimobilis) is a yellow-pigmented, nonfermenting, gram-negative rod with a single polar flagellum that moves slowly (thus paucimobilis), strictly aerobic [(2)] It is categorized as CDC group IIk biotype 1[(3)]. Spingomonas paucimobilis can be found almost anywhere in the environment, especially in soil and water. The bacterium has been found in almost every sample of water (infusion fluid, tube rinsing water, distilled water nebulizer, dialysis fluid and multiple devices used in hospital) even sterile hospital water. Furthermore, the bacterium has been demonstrated to develop biofilm in drinking water pipelines [(4)]. This notorious bacterium has been known to cause meningitis, septicaemia, bacteraemia, peritonitis, and wound infection in immunocompromised patient. In the present study we isolated two cases of Sphingomonas paucimobilis from cerebrospinal fluid (CSF) in a paediatric population. Both of them presented to emergency with high grade fever, vomiting, sign and symptoms of meningitis. Both patients cerebrospinal fluid were inoculated into BacT/Alert 3D bottles) and incubated in BacT/Alert 3D systems (Bio Merieux). Within 24-48 hours, the BacT/Alert 3D systems recorded positive growth in both cases. Gram stain was done from both the bottles which revealed gram negative bacilli and Sub-culture was done on Blood agar, MacConkey agar and chocolate agar. On 5%sheep Blood agar and chocolate agar yellow color, smooth non haemolytic colonies were observed after overnight

incubation. No growth was observed in MacConkey agar. From 5%sheep blood agar and chocolate agar gram stain was done which showed non capsulated non sporing gram-negative bacilli. These organisms were identified on the basis of conventional test and use of Vitek 2 Gram negative identification card (Bio Merieux). On conventional test these organisms were 3%Catalase, Oxidase positive and negative for indole, citrate It showed alkaline/alkaline reaction with no gas and H_2S production on TSI agar slant. Confirmation of identification was done by Vitek 2 (Bio Merieux). The Kirby Bauer technique was used to determine antibiotic sensitivity. Both the isolates were sensitive to chloramphenicol, tetracycline, meropenem, imipenem ,3rd generation cephalosporines. Carbapenems were found to be the most effective antibiotic in a study by Bayram et al[(5)]. Reina et al. determined the minimum inhibitory concentration of four isolates and found that they were all susceptible to ciprofloxacin and norfloxacin, implying that aminoglycosides and fluoroquinolones should be the clinical antibiotics of choice for S. paucimobilis infection in humans [(6)]. A study by mehmood et al isolated *S paucimobilis* in CSF sample which were sensitive to meropenem [(7)]. There are no definitive antibiotic therapy guidelines for S paucimobilis, and treatment should be personalised based on the in vitro susceptibility profile of the clinical specimen [(7)].

CONCLUSION

Pseudomonas paucimobilis is a Gram-negative bacilli, non-fermenting yellow pigmented bacterium with a single flagellum that was first identified in 1977. Due to the presence of sphingoglycolipids in the cell membrane, the bacterium was classed and called Sphingomonas paucimobilis in 1990[(8)]. In conclusion, we are presenting a case of meningitis due to S.paucimobilis who responded very well to broad spectrum antibiotic. In conclusion S. paucimobilis can infect children who were previously healthy as well as children who were immunocompromised. Aside from infections caused by S.paucimobilis, it is increasingly observed in clinical settings. It is not related with significant life-threatening infections due to its low virulent properties of bacteria, but these bacteria will play a larger role in health-care settings.

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