



Case Report

Neisseria elongata -mediated peritonitis in an end-stage renal disease patient on automated peritoneal dialysis, A case report and literature review

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ABSTRACT

Introduction: Peritoneal dialysis (PD) can result in peritonitis, which frequently causes severe and near-fatal clinical implications if left untreated. Usually, Gram-positive bacteria are the most common organisms involved. Uncommonly recognized as the cause of peritonitis in PD patients, Neisseria Elongata is a gram-negative nasal and oropharyngeal normal flora organism.

Case presentation: We report a rare case of a 29-year-old man who had received automated peritoneal dialysis for six years and had Neisseria Elongata peritonitis.

Discussion: Several case Reports of niseria-related peritonitis may point to the potential pathogenicity of such organisms and suggest that many cases of culture-negative peritonitis may have been misdiagnosed. Poor nutrition and chronic kidney disease have been suggested as potential risk factors for Neisseria elongata peritonitis [8], both of which are present in our patient. With appropriate antibiotic use, most of the cases respond well to empirical treatment.

Conclusion: Although rare, Neisseria Elongata can lead to Peritoneal Dialysis catheter Peritonitis that, in some cases, require changing to hemodialysis.

1. Case introduction

One of the feared complications of peritoneal dialysis is peritonitis, considered a life-threatening complication and a cause of significant morbidity and mortality most cases of PD peritonitis are encountered due to gram-positive organisms [1].

Neisseria elongate is an organism from the Neisseria genus. It is a gram-negative rod-shaped, catalase-negative bacteria that differentiates it from the other Neisseria species, which are diplococci in shape and catalase positive [2]. based on biochemical characteristics, N.elongata has three subspecies, *elongate*, *glycolytic*, and *nitroreductase* [2].

N.elongata is a normal human flora isolated from the nasopharynx; despite this, there are reported cases of serious conditions, mainly endocarditis, bacteremia, and osteomyelitis [3].

Upon literature review, there is only one case report regarding N. elongata PD peritonitis published in 2014 [4], so here we are willing to share our case of PD peritonitis caused by Neisseria elongata, although still subspecies not defined.

2. Case presentation

A 29-year-old Syrian male patient with a past medical history of end-stage renal disease requiring automated peritoneal dialysis for the past six years, right inguinal hernia, hyperuricemia, and chronic hepatitis C virus infection presented to the emergency department for one week with subjective fever, abdominal discomfort, and dizziness. Abdominal discomfort was generalized and associated with non-bloody vomitus. Apart from that, he has no other complaints. He has no previous History of peritoneal catheter-related peritonitis. His vital signs were temperature of 100 Fahrenheit (F), blood pressure of 139/85 mmHg, respiratory rate was around 20 breaths per minute, pulse rate of 95 beats per minute, and oxygen saturation of 99% on room air. Physical examination was unremarkable except for generalized tenderness in the abdomen with no guarding, rigidity, erythema, or tenderness around the peritoneal catheter exit site. His initial laboratory blood works are shown in [table 1](#).

Subsequently, Peritoneal fluid analysis was sent, and results are

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Table

White blood cell	8.6
Red blood cell	3.0
Hemoglobin	9.5
hematocrit	27.0
Mean corpuscle value	89.4
Mean corpuscle hemoglobin concentration	31.5
platelets	126
Urea	19.1
creatinine	1062
sodium	135
potassium	3.3
Chloride	96
bicarbonate	22
C reactive protein	58.6
White blood cell	8.6
Red blood cell	3.0
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potassium	3.3
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C reactive protein	58.6

shown in table 2.

Based on the above, a diagnosis of peritoneal dialysis-related peritonitis was made; therefore, he was started on intraperitoneal vancomycin and gentamicin, and peritoneal fluid culture was sent. The hospital course was unremarkable. The peritoneal fluid culture showed *Neisseria elongata*, which was sensitive to ceftriaxone and ciprofloxacin and resistant to penicillin. He was discharged home on ceftazidime 1.5 g intraperitoneal daily for three weeks. On follow-up, he was asymptomatic with significant symptomatic improvement.

3. Discussion

Multiple case reports showed the implication of traditionally known nonpathogenic/benign (nongonococcal and nonmeningococcal) *Neisseria* species [5] in serious medical conditions, e.g., *Neisseria elongata* and *Neisseria mucosa* endocarditis [6,7]. Peritonitis was also reported in such species, including *Neisseria elongata* [8], *Neisseria mucosa* [5], *Neisseria cinerea* [9,10], *Neisseria macacae* [11], and *Neisseria subflava* biovar *perflava* [12].

This might indicate a possible virulence of such organisms and even

possible miss diagnosis in many cases of culture-negative peritonitis, especially in the failure of first-line antibiotic therapy [10]. This should lead us to a conclusion that the terminology “nonpathogenic/benign” *Neisseria* species should be questioned [5]. Awareness of such serious medical sequelae of these organisms may help in early and prompt diagnosis and management.

Possible reported risk factors for *Neisseria elongata* peritonitis are poor nutrition and chronic kidney disease [8], which implies our patient. Oral cellulitis was implicated as a likely source of *Neisseria mucosa* peritonitis in one of the case reports [5].

Our patient organism was sensitive to ciprofloxacin and ceftriaxone. Ciprofloxacin (oral and intraperitoneal) showed effectiveness in treating nonpathogenic *Neisseria* peritonitis [5,10]. Ceftriaxone -along with gentamycin-was also found to be successful in treating *Neisseria elongata* peritonitis [8]. Intraperitoneal ceftazidime (2–3 weeks) was a successful agent in our patient’s treatment and another reported case of *Neisseria subflava* biovar *perflava* peritonitis [12], both of which had a penicillin-resistant organism.

The empiric treatment used in such cases included intraperitoneal cefazolin and amikacin [8], intraperitoneal vancomycin and cefepime [5], and intraperitoneal vancomycin and ceftazidime [10]. Failure of response was reported with empiric intraperitoneal cefazolin and amikacin in treating *Neisseria elongata* peritonitis case report; however, the rest two mentioned above did not confirm failure or response to empiric therapy. None of the cases were complicated due to failure of empiric treatment, and all of them eventually responded to appropriate antibiotic treatment based on the culture sensitivity mentioned above [13].

Preservation of the dialysis catheter and absence of membrane failure was the primary outcome in most nonpathogenic *Neisseria* peritonitis, including our patient. However, this might not reflect the actual effect due to the few numbers of reported cases.the work has been reported in line with the SCARE 2020 criteria [14].

4. Conclusion

This is a case of *Neisseria elongata*-related peritonitis in non-immunocompromised adults, an uncommon peritonitis causative organism. After a literature review, we believe our case is the second published case of this microbe causing peritonitis. In addition to discussing possible management options for this situation, we aim to remind our colleagues that this organism can be one of the unusual causes of peritonitis.

Ethical approval

The case report was approved by Hamad Medical Corporation Medical Research Centre.

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Author contribution

Ahmed Alsayed identified the case, reviewed the literature, and wrote the manuscript. ELMustafa Abdalla is the corresponding author who helped in manuscript writing, doing a review for literature. Bashir Ali, Ahmed Hatem, Khalid Albasheer, Mohamed Elhadi and Amna Makawi helped in identifying the case, reviewing the literature, and doing the final review and approval for the manuscript.

Registration of research studies

Not required.

Table

Body fluid type cell count	Peritoneal
Color body fluid	colorless
Appearance body fluid	turbid
White blood cell body fluid	3438
Red blood cell body fluid	nil
Neutrophil body fluid	81.0
Lymphocyte body fluid	6.0
Monocyte body fluid	10.0
Eosinophil body fluid	1.0
Body fluid type cell count	Peritoneal
Color body fluid	colorless
Appearance body fluid	turbid
White blood cell body fluid	3438
Red blood cell body fluid	nil
Neutrophil body fluid	81.0
Lymphocyte body fluid	6.0
Monocyte body fluid	10.0
Eosinophil body fluid	1.0

Guarantor

ELMustafa Abdalla.

Consent

Written informed consent was obtained from the patient for publication of this case report and the accompanying image. A copy of the written consent is available for review by the Editor-in-Chief upon request.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Declaration of competing interest

The authors have no competing of interest to declare.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.amsu.2022.104920>.

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