



CASE OF DISSEMINATED NOCARDIOSIS PRESENTING IN AN IMMUNOCOMPROMISED PATIENT

General Medicine

Bhavik Thacker

Shaifali Vainsh

Utsav Vaghani

KEYWORDS

INTRODUCTION

Patients with deficiencies in cell mediated immunity are at high risk of infection with opportunistic pathogens such as *Nocardia*¹. It is challenging to diagnose and can have multisystem manifestations. Failure to diagnose and appropriately treat can result in significant mortality^{2,3}. Nocardiosis is known as an opportunistic infection in immunocompromised hosts, but occasionally it has been reported in immunocompetent patient⁴. *Nocardia* infects the lungs, skin, central nervous system (CNS) or other organs presenting as localized or disseminated infections. Pulmonary nocardiosis is the main type of nocardiosis. Nocardiosis involves the lung in 60–70% of cases⁵. The data about worldwide incidence of *Nocardia* infection is limited and unclear. In An American study, Annual incidence of nocardiosis in United State is about 500–1000 cases per year⁶. Patients with the greatest susceptibility to this include those with solid organ transplant, hematopoietic stem cell transplant recipients, human immunodeficiency virus (HIV) infected patients, patients taking corticosteroids for a long time or patients with ongoing malignant processes⁷.

CASE HISTORY

A case of a 45-year-old male patient with complaint of severe generalised weakness, bilateral pedal edema, weight loss, anorexia for 1 month and cough with excitation- whitish yellow for 10 days. X Ray and HRCT were suggestive of cavities. Bronchoscopy was done to rule out malignancy which was negative. BAL was positive for *Nocardia* (ZN stain + culture). Patient gradually developed an inability to move all four limbs, NCV was done on neuro advice – Guillain Barre Syndrome was diagnosed.

Patient was intubated and mechanically ventilated. Patient developed septic shock and expired.

PAST HISTORY

K/C/O severe ulcerative colitis since November 2022- (Colonoscopy – biopsy confirmed)- Injectable steroids, Tab Prednisolone 50 mg and Mesalazine.

No p/h/o Tuberculosis, Covid, CVA, IHD, Thyroid disease

On examination patient had tachycardia, hypotension and mild hypoxia spo2=92% on RA

Investigations

HB - 9.1, WBC - 11.9, RBC - 3.55, Neutrophil - 90, Lymphocyte - 8
ESR - 71, Xray chest - 16/2/23

Patchy air space opacity noted in right upper and mid zone with internal cavitation, possibility of infective aetiology -lung abscess HRCT 16/2/23.

Impression - active infective aetiology in form of cavitory lesion with internal air fluid levels - lung abscess.

BAL Routine Microscopy (RM): ---- blood +, cobweb absent, TC: 250, polymorph: 40, lymphocyte: 60, RBC many

Modified ZN stain = *Nocardia*

CSF: RM - total counts - 0

TC = nil

ADA = 2.9 normal

Protein = 77.8 (increased)

Sugar = 37 (decreased)

MRI Brain Contrast

Impression - well defined altered signal intensity lesion with perilesional edema in left parasagittal occipital lobe — brain abscess

Management

Patient diagnosed with Disseminated (CNS + pulmonary) nocardiosis patient was treated with multiple antibiotic regimen - Trimethoprim + Sulfamethoxazole given for 10 days, Imipenem, and Amikacin and VCV mode of mechanical ventilation.

DISCUSSION

Patient presented with severe generalised weakness, anorexia, cough with expectoration, breathlessness, tachycardia, hypoxia with cavitory lesion in lung and ring enhancing type lesion on MRI brain contrast all of which points towards Nocardiosis in this setting.

No Cardiosis Symptoms Include:

Fever
Weight Loss
Night Sweats
Cough
Chest Pain
Pneumonia
Headache
Weakness
Confusion
Seizures

IV antibiotics trimethoprim + sulfamethoxazole + imipenem + amikacin is used as multiple drug therapy for treatment of CNS + pulmonary nocardiosis

Susceptibility differs among the species⁸. TMP-SMX is active against most *Nocardia* species; however, *N. otitidiscaviarum* is commonly resistant to TMP-SMX, and *N. nova* and *N. farcinica* are occasionally resistant. So, it is important to identify of *Nocardia* species and determine antimicrobial susceptibility.

N. exalbida was first isolated from two immunocompromised patients with a cutaneous lesion and lung abscess in 2006⁹. Till date, 10 cases of nocardiosis caused by *N. exalbida* have been reported.

Various types of localized infections caused by *N. farcinica* have often been reported, including catheter-related bloodstream infection¹⁰, brain abscess¹¹, bursitis¹², mediastinitis¹³, and soft tissue infections¹⁴. Although *Nocardia* species can infect immunocompetent hosts¹⁵, they are generally recognized as important opportunistic pathogens in immunocompromised hosts¹⁶.

CONCLUSION

Nocardiosis infection mainly presents in immunocompromised patients such as those on immunosuppressants, or immunocompromised.

Therefore, constitutional symptoms in immunocompromised sometimes can be misleading towards a much simpler diagnosis such as viral fever which has to be kept in mind.

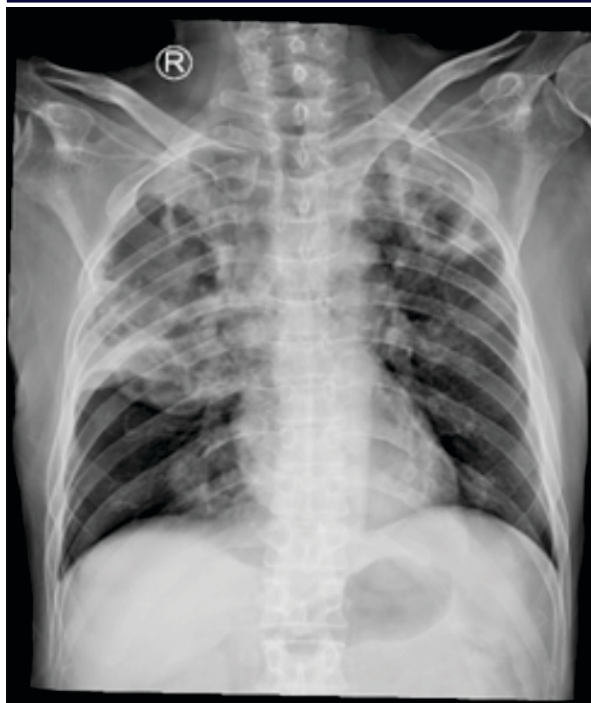


Fig. 1- Patchy Air Space Opacity Noted In Right Upper And Mid Zone With Internal Cavitation, Possibility Of Infective Aetiology - lung Abscess

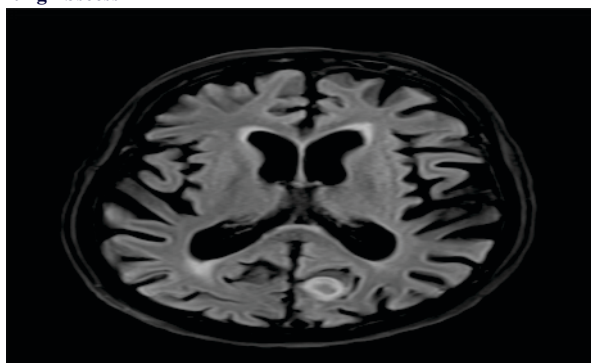


Fig.2 -MRI Brain Shows Well Defined Altered Signal Intensity Lesion With Perilesional Edema In Left Parasagittal Occipital Lobe — Brain Abscess

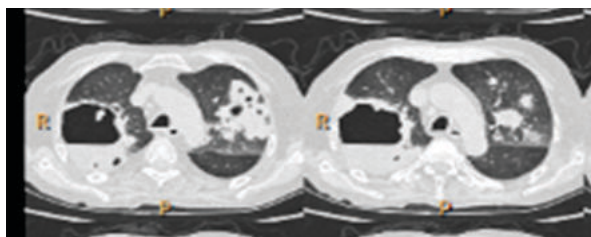


Fig.3- HRCT Shows Active Infective Aetiology In Form Of Cavitary Lesion With Internal Air Fluid Levels - Lung Abscess.

REFERENCES

1. Wilson JW. Nocardiosis: updates and clinical overview. *Mayo Clin Proc.* 2012; 87 (4) : 403-7.
2. Steinbrink J, Leavens J, Kauffman CA, et al. Manifestations and outcomes of nocardia infections comparison of immunocompromised and non-immunocompromised adults. *Medicine* 2018; 97: 40(e12436).
3. de Clerck F, Van Ryckeghem F, Depuydt P, et al. Dual disseminated infection with Nocardia Farinica and mucor in a patient with systemic lupus erythematosus: a case report. *J Med Case Rep* 2014; 8: 376.
4. Alavi Darazam I, Shamaei M, Mobarhan M, Ghasemi S, Tabarsi P, Motavasseli M, et al. Nocardiosis: risk factors, clinical characteristics and outcome. *Iran Red Crescent Med J.* 2013;15(5):436-9.
5. Lederman ER, Crum NF. A case series and focused review of nocardiosis: clinical and microbiologic aspects. *Medicine (Baltimore).* 2004;83(5):300-13.
6. Beaman BL, Burnside J, Edwards B, Causey W. Nocardial infections in the United States, 1972-1974. *J Infect Dis.* 1976;134(3):286-9.
7. Patel R, Paya CV. Infections in solid-organ transplant recipients. *Clin Microbiol Rev.* 1997 Jan;10(1):86-124.
8. Lerner PI. Nocardiosis. *Clin Infect Dis.* 1996;22(6):891-903 quiz 904-895.
9. Mcneil MM. Evaluation of therapy for nocardia-asteroides complex infections. *Infect Dis Clin Prac.* 1995;4(4):287-92.
10. Iida S, Kageyama A, Yazawa K, Uchiyama N, Toyohara T, Chohnabayashi N, et al. Nocardia exalbida sp. nov., isolated from Japanese patients with nocardiosis. *Int J Syst Evol Microbiol.* 2006;56(Pt 6):1193-6.
11. Heo ST, Ko KS, Kwon KT, Ryu SY, Bae IG, Oh WS, Song JH, Peck KR. The first case of catheter-related bloodstream infection caused by Nocardia farcinica. *Journal of Korean medical science.* 2010 Nov 1;25(11):1665-8.
12. Sim SH, Park HC, Kim CJ, Jeon JH, Kim EC, Oh MD, Kim NJ, Choe KW. A case of Nocardia farcinica brain abscess in the patient receiving steroid treatment. *Infection and Chemotherapy.* 2008 Oct 1;40(5):301-4.
13. Park SD, Kim HJ, Jang IH, Uh Y, Kim J, Yoon KJ, Oh JR. First report of Nocardia farcinica bursitis in a patient with diabetes mellitus. *Annals of Laboratory Medicine.* 2014 May;34(3):252.
14. Kim J, Kang M, Kim J, Jung S, Park J, Lee D, Yoon H. A case of Nocardia farcinica pneumonia and mediastinitis in an immunocompetent patient. *Tuberculosis and Respiratory Diseases.* 2016 Apr 1;79(2):101-3.
15. Baek JO, Kim JS, Lee SK, Jeong JH, Lee MJ, Seo IH. Two cases of primary cutaneous nocardiosis caused by intralesional injection. *Dermatologic Therapy.* 2019 Jan;32(1):e12775.
16. Budzik JM, Hosseini M, Mackinnon Jr AC, Taxy JB. Disseminated Nocardia farcinica: literature review and fatal outcome in an immunocompetent patient. *Surgical infections.* 2012 Jun 1;13(3):163-70.
17. Steinbrink J, Leavens J, Kauffman CA, Miceli MH. Manifestations and outcomes of nocardia infections: comparison of immunocompromised and nonimmunocompromised adult patients. *Medicine.* 2018 Oct;97(40).