ejpmr, 2018,5(4), 488-490

SJIF Impact Factor 4.897

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

OUTBREAK OF NON-TUBERCULOUS MYCOBACTERIAL INFECTION IN SURGICAL WARD OF A TERTIARY CARE HOSPITAL

[1]*Dr. Rajdeep Saha, MD, [2]Dr. Apoorbaa Roy, [3]Dr. Dipika Menon Mukherjee and [4]Dr. Rajyasri Guha Thakurta, MD

[1]Assistant Professor, Department of Microbiology, Calcutta National Medical College and Hospital, Kolkata, India.
[2,3]Post Graduate Trainee, Department of Microbiology, Calcutta National Medical College and Hospital, Kolkata, India.
[4]Professor and Head of the department, Department of Microbiology, Calcutta National Medical College and Hospital, Kolkata, India.

***Corresponding Author: Dr. Rajdeep Saha**

Assistant Professor, Department of Microbiology, Calcutta National Medical College and Hospital, Kolkata, India.

Article Received on 14/02/2018 **Article Revised on 06/03/2018** **Article Accepted on 27/03/2018**

ABSTRACT

Mycobacterium abscessus (*M. abscessus*) is a rapidly growing mycobacterial species which are ubiquitous in the environment and cause widespread infections. The incidence of these infections increased in recent decades and is of particular public health concern as nosocomial pathogens. This study was conducted to isolate and identify Non-Tuberculous Mycobacteria (NTM) from wound swab sample from post-operative surgical site infection along with finding out the source of infection and forming a treatment protocol for prevention of the same. 411 samples were collected. These samples were subjected to Gram Staining, Ziehl-Neelsen Staining and inoculating on culture plates containing Blood Agar, MacConkey Agar and Lowenstein-Jensen Media. The ZN stain done from the growth as well as the direct swab sample collected from the patients portrayed the presence of Acid Fast Bacilli. The isolated strains were further confirmed by PCR. Swab from OT instruments, trolleys, surgical gowns and other environmental samples and water from the boiler and copper drum was taken for determining the source of infection. Here too the isolates were sent for PCR for identification. 332 out of 411 patients were suffering from NTM infections. The PCR result confirmed it to be *Mycobacterium abscessus*. The samples collected to determine the source of infection revealed that the infection was due to inadequate sterilisation of boiler water which contaminated the surgical site. Disinfection protocol and antibiotic stewardship was prepared after several meetings. The patients were cured using Clarithromycin 500mg BD for 6 months.

KEYWORDS: *Mycobacterium abscessus*, Surgical site infection, PCR, Antibiotic stewardship.

INTRODUCTION

Mycobacterium abscessus (*M. abscessus*) is one of the rapidly growing mycobacterial species found in soil, dust and water.[1] It belongs to Runyon's Group IV and produces mature growth on Lowenstein Jensen media showing non pigmented colonies within seven days of aerobic incubation. M.abscessus was first described by Moore and Frerichs in 1953.[2]

These drug resistant Non-Tuberculous Mycobacteria (NTM) are ubiquitous in the environment and are capable of causing widespread infections like Cutaneous, Pulmonary as well as Surgical Site Infections (SSI). The incidence of infections by rapidly growing mycobacteria has increased in recent decades. This is partly attributed to the increased frequency of surgical procedures and the more efficient ways of identification of the pathogen.[3]

These rapidly growing NTM are of particular public health concern as nosocomial pathogens as they are resistant to standard disinfectants, including chlorine, organomercurials, and alkaline glutaraldehyde.[4],[5],[6] Moreover incorrect use and management of disinfectants can cause nosocomial outbreaks, which is hazardous in health care setting.[7],[8]

This study was conducted in our institute in collaboration with other institutes to:

1. Isolate Non-Tuberculous Mycobacteria from wound swab sample from post-operative surgical site infection.
2. Find out source of infection.
3. Make a protocol for prevention of this infection in hospital care settings.

MATERIALS AND METHOD

Samples were collected for a period of two and a half months. Total number of cases accounted to 411.

A selection criteria was formed which included patients attending surgery OPD during post-operative period with a history of wound discharge. Swabs from the discharge of these patients were taken.

Figure 1: Serous fluid was collected from here with a swab.

These were subjected to Gram Staining, Ziehl-Neelsen Staining and inoculating on culture plates containing Blood Agar and MacConkey Agar; as well as in Lowenstein-Jensen Media.

The Ziehl-Neelsen staining done from the direct smear of swab samples of the patients demonstrated the presence of Acid Fast Bacilli.

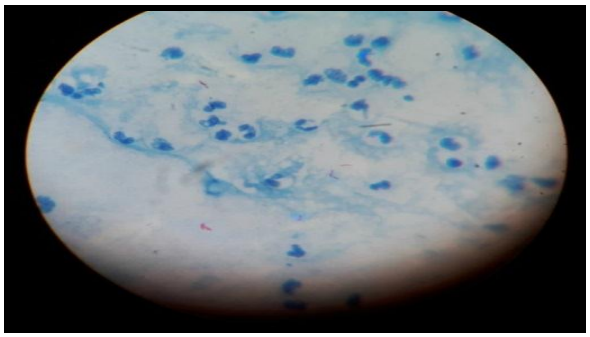

Figure 2: ZN stain of a direct smear from sample showing acid fast bacilli.

There was no growth observed on the former two culture media after a week of aerobic incubation, but the Lowenstein Jensen media showed presence of non-pigmented colonies at the end of 6 days of aerobic incubation.

Figure 3 : Colony observed on LJ media after aerobic incubation within 6 days

The Ziehl-Neelsen staining done from this growth on LJ media also portrayed the presence of Acid Fast Bacilli.

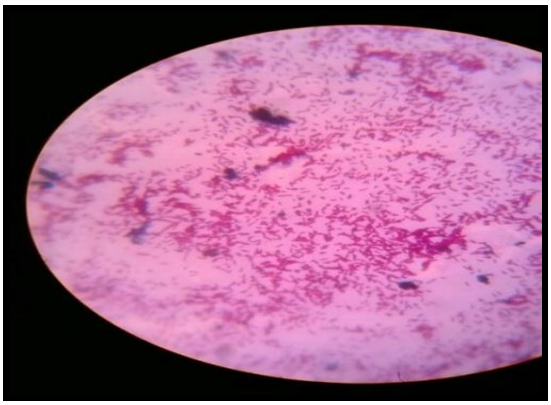

Figure 4: ZN stain done from the growth on LJ medium showing acid fast bacilli.

Few biochemical tests were done and the isolated strains were for further confirmation by PCR.

The next series of sample collection were done to bring light on the source of infection. Swabs were taken from OT instruments, trolleys, surgical gowns and other environmental samples. Water from the boiler and copper drum was also taken.

Figure 5: Copper Drum

Figure 6: Boiler for instrument trays/bowls

These were also subjected to similar procedures as done for the samples collected from the patients and here too the isolated strains were sent to referral laboratory for confirmation by PCR.

RESULTS AND DISCUSSION

Total numbers of cases were 411.

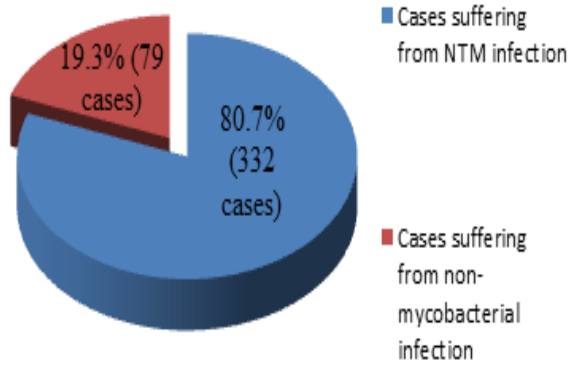

Figure 7: Pie chart representing percentage of cases showing NTM infection vs non-mycobacterial infection.

The PCR result done from the isolates confirmed it to be *Mycobacterium abscessus*.

Out of all the samples from hospital only the boiler water showed the presence of *M. abscessus.*

CONCLUSION

Primarily this outbreak of surgical site infection was due to *M. abscessus.* The source of infection was contaminated boiler water which supplied the OTs of the surgery department.

Figure 8: Boiler for instruments.

Inadequate sterilisation of this boiler water contaminated the surgical site. During this period multiple Hospital Infection control meetings at 10-15 days intervals were held. Disinfection protocol and antibiotic treatment protocol (Antibiotic stewardship) was prepared. Ultimately all patients were cured by using the regimen of Clarithromycin 500mg BD for 6 months.

ACKNOWLEDGEMENT

I would sincerely like to thank SRL Ranbaxy Limited for carrying out the PCR and confirming the isolated strain to be *M. abscessus*. Their expertise in this field actually helped us identify the causative agent and prepare a treatment regimen.

REFERENCES

1. Kwon YH, Lee GY, Kim WS, Kim KJ. A case of skin and soft tissue infection caused by Mycobacterium abscessus. Ann Dermatol, 2009; 21: 84-87.
2. Moore M, Frerichs JB. An unusual acid-fast infection of the knee with subcutaneous, abscess-like lesions of the gluteal region; report of a case with a study of the organism, *Mycobacterium abscessus*, n. sp. J Invest Dermatol, 1953; 20: 133–169.
3. Sousa, P.P., Cruz, R.C., Schettini, A.P. et al. Mycobacterium abscessus skin infection after tattooing- case report. An Bras Dermatol, 2015; 90: 741-743.
4. Koh SJ, Song T, Kang YA, et al. An outbreak of skin and soft tissue infection caused by mycobacterium abscessus following acupuncture. Clin Microbiol Infect, 2010; 16: 895-901.
5. Selvaraju, SB, Khan, IU, and Yadav, JS. Biocidal activity of formaldehyde and nonformaldehyde biocides toward Mycobacterium immunogenum and Pseudomonas fluorescens in pure and mixed suspensions in synthetic metalworking fluid and saline. Appl Environ Microbiol, 2005; 71: 542–546.
6. Carson, LA, Petersen, NJ, Favero, MS, and Aguero, SM. Growth characteristics of atypical mycobacteria in water and their comparative resistance to disinfectants. Appl Environ Microbiol, 1978; 36: 839–846.
7. Tiwari, TS, Ray, B, Jost, KC Jr et al. Forty years of disinfectant failure: outbreak of postinjection Mycobacterium abscessus infection caused by contamination of benzalkonium chloride. Clin Infect Dis., 2003; 36: 954–962.
8. Kressel, AB and Kidd, F. Pseudo-outbreak of Mycobacterium chelonae and Methylobacterium mesophilicum caused by contamination of an automated endoscopy washer. Infect Control Hosp Epidemiol, 2001; 22: 414–418.