CASE REPORT

OUTBREAK OF EXTENSIVELY DRUG RESISTANT *STENOTROPHOMONAS MALTOPHILIA* IN BURN UNIT

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*Stenotrophomonas maltophilia*is an emerging cause of nosocomial infections. We report an outbreak of XDR-*Stenotrophomonas maltophilia* infection from burn unit of a tertiary care hospital in July 2016. The strain isolated was resistant to all antimicrobials tested but colistin. Outbreak investigation was carried out which subsided after timely intervention. Patients were treated adequately by Colistin.

Keywords: Burn unit, Outbreak*; Stenotrophomonas maltophilia*

J Ayub Med Coll Abbottabad 2017;29(4):686–8

INTRODUCTION

Stenotrophomonas maltophilia is an emerging nosocomial pathogen. *Stenotrophomonas maltophilia* has low virulence but it is able to survive in low nutrient environment particularly in water. This bacterium also has the ability to form bio films and adhere to inanimate objects like intravenous cannulas that can serve as a potential source of infection.[1] It can cause wide variety of infections especially of respiratory tract.[2] It has also been observed as a pathogen complicating burns, causing burn site infections.[3] *Stenotrophomonas maltophilia* is found resistant to many antimicrobials including polymyxins.[1] Multidrug resistant (MDR) gram negative rods are defined as strains resistant to three or more groups of antimicrobials and extensively drug resistance (XDR) is taken as a strain resistant to all antimicrobials except one or two.[4] We report a case series when seven patients in burn unit of a tertiary care hospital, Rawalpindi were infected by this XDR *Stenotrophomonas maltophilia* in July 2016.

CASE SERIES

A total of seven patients were infected by this pathogen. The first patient, a nine years old boy developed pus of electrical burn exit wound by *Pantoae agglomerans* on third day of hospitalization. Patient was already receiving prophylactic antimicrobials (amikacin and amoxicillin-clavulanate). Isolate was sensitive to imipenem and amikacin so, imipenem was added in regime. Four days later a pus culture was sent again to microbiology lab that revealed Methicillin resistant coagulase negative *Staphylococcus* and *Stenotrophomonas maltophilia.* Patient was treated with colistin and linezolid. However, on twentieth day patient became febrile and disorientated. Later, he was found to have bactermia by *Stenotrophomonas maltophilia* and meningoencephalitis. However, patient was adequately treated with colistin through extra-ventricular device for eighteen days. Patient was discharged on fiftieth day of admission.

Second patient was young girl of eighteen years with second degree oil burns on left arm, part of abdomen and left thigh. Total burned surface area (TBSA) was 18%. Patient was put on prophylactic antimicrobials (amoxicillin-clavulanate) and alternate day dressing. However, patient was febrile on third day of admission. Culture yielded *Stenotrophomonas maltophilia,* which was adequately treated with colistin for ten days. Patient was discharged after twelve days of treatment and followed up in out-patient department.

Third patient an eight years old girl had second degree deep flame burns. TBSA was 15%. Patient received appropriate wound care with alternate day dressing and prophylactic amoxicillin/clavulanate. Patient was stable wound appeared healing so, she was discharged and followed in out-patient department. On follow-up visit numerous scratch marks were noted and pus was seen around the wounds. Patient was admitted again. Culture revealed same strain of *Stenotrophomonas maltophilia.* Colistin was administered with success. Repeat culture on fifth day of readmission was negative. Colistin was administered for a total of ten days. Patient spent a total of thirty-five days in hospital.

Fourth patient was a twenty-four years old lady who got accidental second-degree steam burns from pressure cooker. TBSA was 15%. Patient received amoxicillin-clavulanate and dressing was changed on alternate days. On third and fourth day of admission patient had fever. On seventh day she again had fever, during this time pus culture from burn site revealed *Stenotrophomonas maltophilia.* Colistin was administered for ten days and repeat

culture were negative. Patient was hospitalized for a total of eleven days.

Fifth patient was a seven years old girl with second degree flame burns. TBSA was 18%. Patient was stable and already under antimicrobial prophylaxis with amikacin and amoxicillin-clavulanate. Pus culture revealed *Stenotrophomonas maltophilia.* She was successfully treated with colistin for ten days and spent twenty-nine days in indoor treatment.

Sixth patient was a thirty-six years old female, suffering from second degree flame burns. TBSA was 18%. Patient pus culture was sent on fourteenth day of admission following fever. Culture revealed growth of *Pantoae agglomerans* and MRSA sensitive to meropenem and vancomycin respectively. Repeat culture yielded growth of *Stenotrophomonas maltophilia*. Patient was successfully treated with colistin for ten days and discharged on thirty-third day of hospitalization.

Seventh patient was a case of electric burn on both hands and anterior chest. Multiple wound debridement was done. Patient had fever and subsequent culture on eight day of admission revealed growth of MRSA and *Stenotrophomonas maltophilia.* Patient was successfully treated with colistin for ten days and spent a total of twenty-eight days in indoor facility. The average time of hospital stay of all patients was 28.28 days.

After increasing concern, a team of investigators headed by microbiologist investigated. Various samples were taken and it was found that scissors used in dressing and bathroom shank of burn ward were colonized by same strain of *Stenotrophomonas maltophilia.* Ward fumigation was done and outbreak subsided. Burn unit was kept under surveillance for the next three weeks and no case of *Stenotrophomonas maltophilia* infection was reported from burn unit during this time period.

DISCUSSION

Stenotrophomonas maltophilia has also been a cause of various outbreaks in hospitals in the past.[6,7] In these reports it has been noted that water source and bronchoscopes have served as point source of outbreaks of respiratory tract infections. The ability of bacteria to form bio films has been associated with these outbreaks.[5,6] Moreover, the infections caused by this bacterium are shown to co-exist with other infections namely, MRSA, *Acinetobacter baumannii* etc.[1] In fact, three of the victims in this recent outbreak were co-infected with other bacteria. Co-infection by other gram negative pathogens is also a risk factor for acquisition of infections by *Stenotrophomonas maltophilia.*[2] In medical literature there has been report confirming relationship of *Stenotrophomonas maltophilia* bacteremia in burn patients, with significant association with total burned surface area (TBSA) and prognostic burn index (PBI).[7] Studies have suggested role of ciprofloxacin, anti-pseudmonal penicillins and cephalosporins as empirical therapy for such infections.[8] Co-trimoxazole previously thought as an effective anti-microbial is not as effective these days due to resistance, as seen in this out break.[9] This enlightens the narrow choice of antimicrobials left as treatment options in case of MDR or XDR *Stenotrophomonas maltophilia* as seen in this case. All patients were treated with colistin which appeared to be the only effective drug. However, this also rings an alarm and it is predicted based on these observations that in near future the prevalence and frequency of resistant strains causing hospital infection will increase. Moreover, there is a need of newer drugs effective against this bacterium.

CONCLUSION

Stenotrophomonas maltophilia is a potential threat to burn patients treated in hospital settings. It has serious impact on health of patients. Moreover, extensive drug resistance might cause problem in successful treatment in near future. **Recommendations:** We recommend that burn unit equipment should be properly sterilized. Water sources shall be properly checked as source spreading *Stenotrophomonas maltophilia* in hospital settings.

Acknowledgements: We acknowledge the efforts of staff of burn unit.

AUTHORS' CONTRIBUTION

UA: Writing the manuscript and formation of results. SAA: Revision of manuscript and performed laboratory work. FK: Revision of manuscript and performed laboratory work. IA: Revision of manuscript and performed laboratory work. TB: Revision of manuscript and performed laboratory work.

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Received: 21 February, 2017	*Revised: 4 July, 2017*	*Accepted: 26 May, 2017*

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