



Stenotrophomonas Maltophilia: diagnosis and management of an environmentally ubiquitous multi-resistant organism in the burns population

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Introduction

Stenotrophomonas maltophilia is a ubiquitous aerobic gram-negative bacillus and is an opportunistic pathogen. It has principally but not exclusively caused infections in patients with poor immune response, long ICU stays and burns patients. The danger with *S. maltophilia* is that it is by nature a multi-drug resistant bacterium. Once infected, mortality rates have been reported up to as high as 69%. There are limited studies describing *S. maltophilia* in the burns population. We conducted a literature review for *S. maltophilia* in burns and report our findings with our experience in managing similar patients at Royal North Shore Hospital in the past 10 years.

Method

A literature review was conducted within Pubmed, MEDLINE, Embase and Google Scholar using keywords "Stenotrophomonas Maltophilia", or "Pseudomonas Maltophilia", or "Xanthomonas Maltophilia" and "Burns".

A retrospective cohort analysis was conducted on all patients admitted with burns to Royal North Shore Hospital between January 2009 to August 2019. All patients with a history of *S. maltophilia* infection were included in the study. From medical records, these patients with positive *S. maltophilia* cultures (sputum, blood, wound, line) were reviewed to obtain relevant

epidemiological and clinical data including age, gender, burn type, total body surface area (TBSA) of burn, length of hospitalization and clinical outcomes ; graft loss (defined as skin graft loss of >10% with or without presence of infection) and mortality, were included.

Results

There were 26 patients in total, 23 males and three female, ranged in age from 17 to 88 years (mean of 46.9). There were a total of 21 flame burns, two electrical and three were scald burns. Mean TBSA was 43.1% and mean hospital stay was 76.4 days. Overall graft loss rate 65.4% was 65.4% and mortality rate was 26.9%. Along with age and gender, TBSA was not significantly correlated with mortality ($p=0.49$).

Only one retrospective cohort analysis and two case studies were found in the literature.

Discussion

Stenotrophomonas maltophilia is a multi-drug resistant organism that can cause severe infections and can pose a high risk to patients with burns. Literature reports risks factors for *S. maltophilia* infections are malignancies, prior antibiotic treatments, central venous catheter indwellings, prolonged hospitalization and mechanical ventilation. Therefore, burns patients carry a high risk for *S. maltophilia* infection as burns patients frequently

Patient	Age	Sex	TBSA burn (%)	Mechanism	Graft loss	Length of Stay (days)	Death
1	25	M	63	Flame	Yes	65	N
2	69	F	35	Flame	Yes	45	Y
3	64	M	3	Scald	No	12	N
4	26	M	55	Flame	Yes	58	Y
5	25	M	90	Flame	Yes	94	Y
6	39	M	50	Flame	No	47	N
7	39	M	35	Flame	Yes	94	N
8	49	M	30	Electrical	No	53	N
9	17	M	60	Flame	Yes	68	N
10	42	M	70	Flame	Yes	127	N
11	25	M	50	Flame	No	83	Y
12	60	M	1.5	Scald	No	37	N
13	59	M	2	Scald	Yes	75	N
14	52	M	33	Flame	No	14	N
15	57	M	80	Flame	Yes	15	Y
16	41	F	52	Flame	Yes	108	N
17	79	M	22	Flame	Yes	25	Y
18	24	M	12	Flame	No	11	N
19	61	M	35	Flame	Yes	80	N
20	42	M	82	Flame	Yes	191	N
21	42	M	85	Flame	No	105	N
22	37	F	85	Flame	Yes	243	N
23	62	M	22	Electrical	No	78	N
24	45	M	18	Flame	Yes	116	N
25	50	M	37	Flame	Yes	73	N
26	88	M	15	Flame	Yes	70	Y

Table 1. Demographics and clinical outcomes of burns patients with *Stenotrophomonas maltophilia* infections

require central venous catheters, mechanical ventilation and prolonged hospital admission especially if the severity of burn is high. Our reported mortality in *S. maltophilia* burns patients is 26.9%, which is similar to Tsai et al. This is the largest study to date regarding *S. maltophilia* infections and burns, with 26 cases.

Conclusion

Given high mortality surrounding *S. maltophilia* infections in burns patients, independent of age, gender and TBSA burn. It is important to recognise the seriousness of a diagnosis of *S. maltophilia* and to treat accordingly in order to optimize the outcome of this cohort of patients.

References available on request