Quantifying The Impact of Inhalational Burns: A Prospective Study

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Background

Inhalational injury is a major cause of morbidity and mortality in burns patients.

Methods

A prospective study was done on consecutive admissions to a major burns centre over 15 months from January 2015 - March 2016.

Diagnosis of inhalational injury

Symptoms and signs of inhalational injury	Nasoendoscopy
<ul style="list-style-type: none">Hoarseness of voiceSore throatDyspneaPainful respirationsCarbonaceous sputumTachypneaStridorFacial burns/ mucosal burns of lips and mouthSinged facial hair/ nasal hairSoot in nostrils or mouth	<ul style="list-style-type: none">Airway erythema/edemaSoot in airwaysAbnormal mobility and appearance of vocal cords

Results

	Cutaneous burns only	Inhalational burns	P value, U
Number of patients	167	35	-
TBSA (median)	5	9	0.036, U =3582
Age(mean)	38.8	44.1	0.176, U=2451
Surgeries (median)	1.000	3.000	0.003. U=3552
Length of stay (median)	8	21	0.004, U=3582
Length of ICU stay(median)	0	3	<0.001, U =4785
Days of IV antibiotics (median)	3	9.5	0.014, U= 3552

Inhalational injury predicted AKI with an adjusted odds ratio (OR) of 17.43 (95% CI 3.07-98.87, p<0.001), ARDS, OR 106.71 (12.73-894.53, p<0.001) and Pneumonia, OR 13.87 (2.32-82.94, p =0.004).

	Inhalational injury			Inhalational injury, adjusted for TBSA		
	OR	95% CI	p value	Adj. OR	95% CI	p-value
All complications	8.33	3.62-19.17	<0.001	5.31	2.17-12.98	<0.001
Pneumonia ¹	48.75	10.30-230.55	<0.001	13.87	2.32-82.94	0.004
ARDS ²	156.78	19.69-1248.17	<0.001	106.71	12.73-894.53	<0.001
AKI ³	48.75	10.31-230.55	<0.001	17.43	3.07-98.87	<0.001
Bacteremia [^]	18.68	5.50-63.39	<0.001	2.39	0.38-15.04	p>0.05
Burn wound infection [^]	3.15	1.49-6.67	0.003	1.28	0.49-3.35	NS

¹ ABA (American Burns Association) guidelines. ² Berlin criteria
³ AKIN (Acute Kidney Injury Network) classification stage 2 and above
OR: Odds ratio. CI Confidence interval. NS Non-significant

Bacteriology

Acinetobacter baumannii was the most frequently cultured bacteria in sputum, blood and tissue cultures with inhalational injury. Gram-negative bacteria were predominantly cultured from tissue in patients with inhalational injury, whereas gram-positive bacteria were predominantly cultured from tissue in patients without inhalational injury.

Conclusion

Inhalational injury accompanying burns significantly increases the length of stay, mortality and complications (AKI, ARDS, infection and sepsis).