Laryngeal inhalational injuries: A systematic review

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Introduction

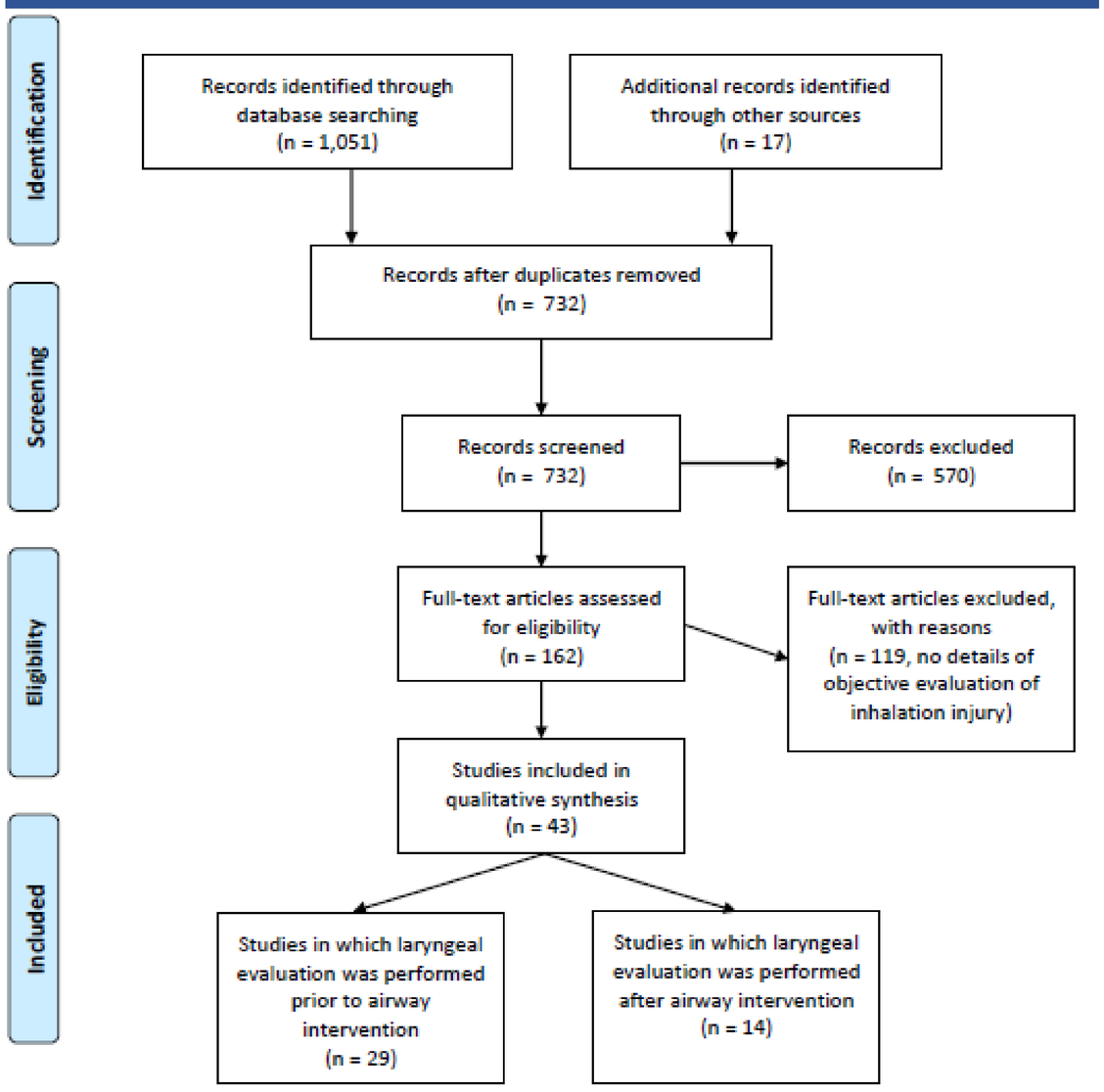
- Inhalational injuries occur in ~10% of burn patients
- Diagnosis often made on clinical suspicion rather than laryngoscopy
- Clinical deterioration may necessitate immediate intubation
- Majority of inhalational injury studies focus on pulmonary injuries
- Subglottic region may be more sensitive to inhalational injury
- Fulfillment of traditional criteria may lead to prophylactic intubation

Aim: To compile existing literature addressing thermal inhalation injuries to the laryngotracheal complex specifically with regards to clinical presentation, physical exam findings, and delayed sequelae

Goal: To optimize early consultation and intervention to reduce long-term morbidity

2011 ABA guidelines	Traditional
• Full thickness facial burns	• Suspected smoke inhalation
• Stridor	• Oropharynx soot
• Respiratory distress	• Hoarseness
• Swelling on laryngoscopy	• Dysphagia
• Upper airway trauma	• Singed facial hair
• Altered mentation	• Oral edema
• Hypoxia/hypercarbia	• Oral burn
• Hemodynamic instability	• Non-full thickness facial burn

Materials and Methods

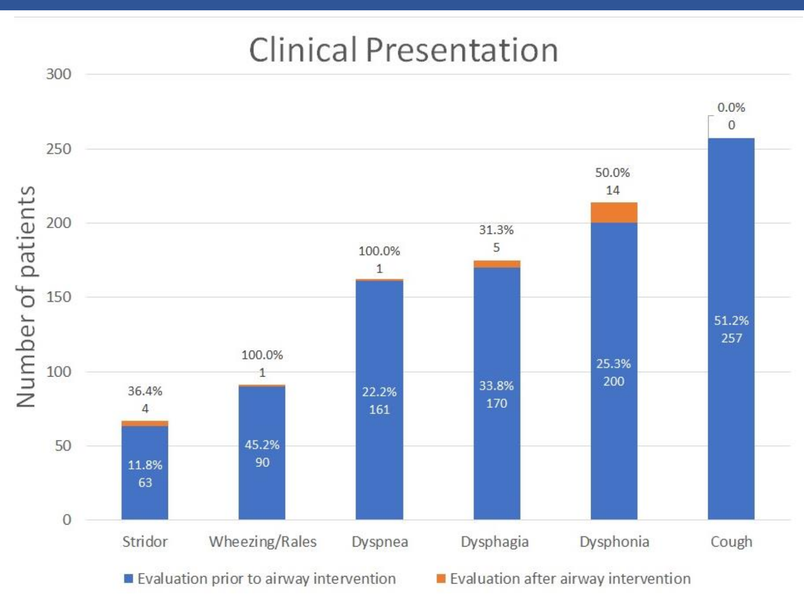


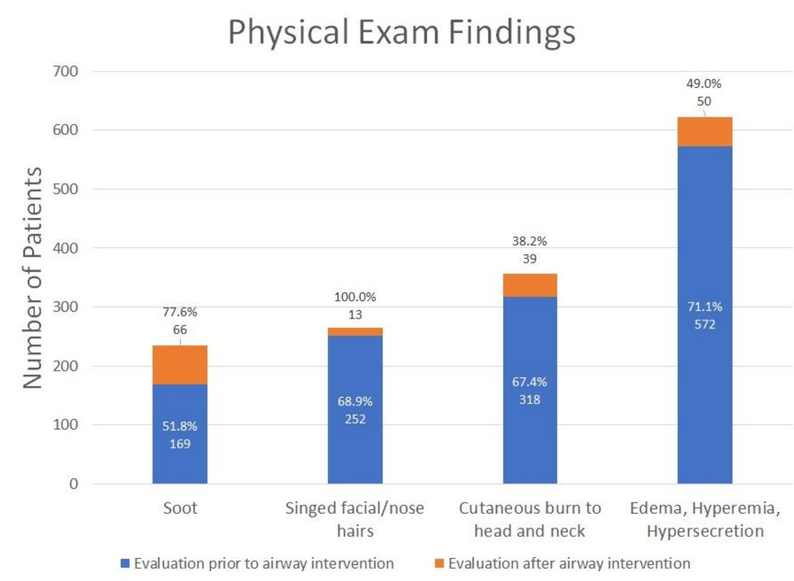
Study demographic variables:

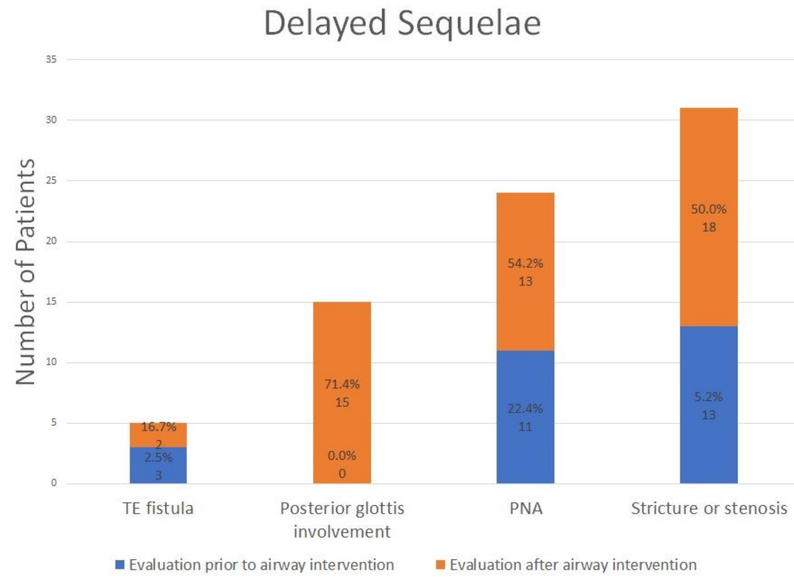
- Title
- Lead Author
- Institution
- Country
- Published date
- Study data
- Journal
- Study Type
- Sample Size
- Deaths
- Intubated
- Tracheostomy
- Age
- Sex
- Open/Closed space injury

Results

- In the group of patients in whom airway intervention precluded laryngeal evaluation, all studies that specified the circumstance of the burn injury indicated that burns occurred in enclosed spaces
- Laryngeal inhalational injury noted prior to airway intervention had a higher mortality rate than those in which findings were noted after airway intervention (17.4%, n = 143 of 824, versus 4.2%, n = 3 of 79) – **not statistically significant (p=0.245)**
- Both groups underwent tracheostomies at relatively similar rates
- Higher mortality rate noted in group with delayed airway intervention (17.4% versus 4.2%, p = 0.245)







Discussion

- Presentation and Exam
  - Cough and dysphonia most commonly noted
  - Dysphagia, dyspnea, wheezes/rales, stridor less common
  - Cutaneous burns and singed facial/nasal hairs
  - Stenosis most commonly in subglottic region
- Majority of intubations may be unnecessary
- Need for serial surveillance as the initial airway exam can evolve
- Limitations:
  - Variability in reporting study variables
  - Not many studies with long-term follow-up
- Future directions: indications for intubations, reason for death

Conclusions

- Laryngeal subset of inhalational injuries are distinct
- Intubation often required to secure airway
  - Reduced level of consciousness
  - Acute upper airway obstruction
- *** more often in enclosed space
- Early intubation may contribute to posterior glottic stenosis or subglottic stenosis
- If circumstances allow, laryngeal exam should be performed

Contact