Supraglottic airway use in neonates and young infants.

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Background/Objectives

Supraglottic airways (SGAs) offer an alternative approach to ventilation and oxygenation. A growing body of evidence demonstrates their effectiveness in pediatrics as an airway management rescue technique and a conduit for endotracheal intubation when traditional intubation poses challenges (1-4).

Our aim: describe the use of SGAs for primary airways, rescue ventilation, and as a conduit for intubation in neonates and young infants.

Hypotheses

We hypothesized that:

1. SGAs would be infrequently used among patients under 2 months of age.
2. SGAs would be a safe, efficacious airway management tool for young infants.

Methods

- Study population: infants less than 2 months of age at our center between 8/2012 – 5/2024.
- We describe the demographics, medical characteristics, and airway management practices in this cohort.
- Data are presented as median (IQR) or frequency (%).

Results

- We reviewed 9722 anesthetics.
- An SGA was used in 131/9722 (1.4%, 95% CI 1.1%-1.6%).
- Median age was 41.5 days, median weight was 3.7 kg; 36% of this group was born preterm.
- An SGA was used electively as the primary airway in 60/131 (46%) of cases, predominantly imaging, vascular access, and pulmonary procedures.
- In 23 cases, an SGA was placed in an awake infant to facilitate induction.
- In 11 cases, successful intubation occurred using the SGA as a conduit.
- In 26 cases, an SGA provided rescue oxygenation and ventilation, including 4 cases in which intubation failed.
- There were 3 cases of airway-related cardiac arrest in which an SGA was used to establish oxygenation and ventilation with subsequent return of spontaneous circulation.
- Endotracheal intubation was attempted in 71 cases. First-attempt success rate was 42% and incidence of difficult intubation (defined as 3+ attempts) was 38%. These patients frequently required advanced techniques, including rigid bronchoscopy.
- Table data are presented as n (%) or median (interquartile range).

Table 1. Baseline demographics and medical characteristics of patient cohort.

Number of cases	**131**
Unique patients	124
Sex	
Male	74 (56.5%)
Female	57 (43.5%)
Age (days)	42.3 (22.5, 58.7)
Less than 7 days old	2441 (25.1%)
Preterm	8 (6.1%)
Weight (kg)	3.6 (3.1, 4.3)
Less than 3kg	23 (17.6%)
Less than 2kg	4 (3.1%)
Less than 1kg	1 (0.8%)
ASA physical status	
I	10 (7.6%)
II	26 (19.9%)
III	68 (51.9%)
IV	26 (19.9%)
V	1 (0.8%)
Emergent procedure	23 (17.6%)

Table 2. Airway management practices.

SGA placed awake	23 (17.6%)
SGA as primary airway	1 (4%)
Subsequent intubation attempts	22 (96%)
SGA as conduit for flexible intubation	11 (8.4%)
SGA used for rescue oxygenation and ventilation	26 (19.1%)
SGA as primary airway	1 (4%)
Subsequent intubation attempts	25 (96%)
Following cardiac arrest	3 (12%)
Airway management	
Endotracheal tube	66 (50.4%)
Supraglottic airway*	63 (48.1%)
Failed intubation	4 (3.1%)
Awakened	1 (0.8%)
SGA for case	3 (2.3%)
Cardiopulmonary bypass	0
SGA placed awake	23 (17.6%)
SGA as primary airway	1 (4%)
Subsequent intubation attempts	22 (96%)
SGA as conduit for flexible intubation	11 (8.4%)
SGA used for rescue oxygenation and ventilation	26 (19.1%)
SGA as primary airway	1 (4%)
Subsequent intubation attempts	25 (96%)
Following cardiac arrest	3 (12%)

Conclusions

- SGAs are a well-described step in the ASA Difficult Airway Algorithm and can be used effectively as a rescue airway management device, either alone or in combination with advanced airway management techniques (5).
- SGAs are infrequently used in the care of neonates and infants, especially as primary airways.
- Our review of SGA use in early infancy revealed SGAs to be an effective airway management tool that can play an essential, successful role as both a rescue device and as a primary airway.

Future Directions

- Prospective studies are warranted to provide more robust evidence regarding the safety, efficacy, and outcomes of SGA use in early infancy and compare SGAs to other airway management strategies to inform clinical decisions in this vulnerable population.

References

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