Do Children with Down Syndrome / Trisomy 21 Have Higher Risk of Perioperative Airway Complications?

Claire Soria MD, Taylor Graber MD, Paola Baskin MD, Mark Greenberg MD, Alyssa Brzenski MD
Department of Anesthesiology, University of California, San Diego

BACKGROUND

Epidemiology

- Incidence 1 in 700 births
- Prevalence: 1 in 1,000 children

Potential Challenges to Airway Management

Upper Airway	Lower Airway
Choanal atresia	Airway malacia
Microdontia	Short neck
Mandibular hypoplasia	Hypotonia
Adenotonsillar hypertrophy	Subglottic stenosis
Macroglossia	
Choanal atresia	

Perioperative Complications and Management

	Complications	Management
Intra-op	• Difficult intubation • Difficult mask ventilation • Bronchospasm	Prepare additional rescue airway equipment
Post-op	• Post-extubation stridor • Airway obstruction	Longer PACU stay or overnight admission

STUDY HYPOTHESIS

There is a low incidence of airway complications, including difficult intubation, difficult mask ventilation, bronchospasm, post-extubation stridor, and airway obstruction in Down Syndrome / Trisomy 21 patients compared to the general population.

METHODS

- Retrospective chart review of pre-op, intra-op and post-op records
- Rady Children's Hospital of San Diego
- April 2012 to August 2017
- Birth to 21 yo
- All genders, ethnicities, and co-morbidities

STUDY POPULATION

- 1,245 anesthetic records: 677 (male), 568 (female)
- Surgical procedures: cardiac (152), dental (144), ENT/eye (414), orthopedic (27), neurosurgery *17), imaging (258), gastrointestinal (148), urologic (17), general (73)
- Intraoperative airway management: LMA (224), mask ventilation (296), endotracheal intubation (725)

INTRA-OP AIRWAY COMPLICATIONS

	Trisomy 21	Non-Trisomy 21*
Total anesthetic records	1,245	380
Difficult intubation	1 (0.08%)	4 (1.05%)
Difficult mask ventilation	4 (0.32%)	3 (0.79%)
Bronchospasm	2 (0.16%)	1 (0.26%)
Laryngospasm	1 (0.08%)	3 (0.79%)
Total	**8 (0.64%)**	**11 (2.89%)**

POST-OP AIRWAY COMPLICATIONS

	Trisomy 21	Non-Trisomy 21
Total anesthetic records	1,245	25,713
Post-extubation stridor	6 (0.48%)	116 (0.45%)
Mask ventilation or re-intubation required in PACU	13 (1.04%)	402 (1.56%)
Total	**19 (1.53%)**	**518 (2.01%)**

DISCUSSION

- Incidence of post-op airway complications: **1.53%** among Trisomy 21 vs. **2.01%** in non-Trisomy 21
- Incidence of intra-op airway complications: **0.64%** among Trisomy 21 vs. **2.89%** in non-Trisomy 21
- Down syndrome is not associated with an increased risk of airway complications.
- Anesthesiologists do not need to take unnecessary precautions that result in overutilization of equipment, staffing, OR and PACU time, cause scheduling delays and increase medical costs.

REFERENCES

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