Tracheal Stenosis Uptick Resulting from Increased Intubation Number Due to Coronavirus 19 (COVID-19): A Retrospective Chart Review

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Background

- Tracheal stenosis refers to an abnormal narrowing of the trachea that restricts your ability to breathe normally. Most cases of tracheal stenosis develop when the trachea is injured after prolonged intubation or from tracheostomies.
- A tracheostomy is a surgical procedure where an opening is created through the anterior/front of neck into the trachea (windpipe) to allow air to fill the lungs. After creating the opening in the neck, a tube is inserted through it to provide an airway and to remove secretions from the lungs. A tracheostomy is often needed when health problems require long-term use of a machine (ventilator) to help you breathe.
- Stenosis risk rises when tracheostomy implantation is delayed by at least 10 days. The COVID-19 pandemic caused extended periods of mechanical ventilation beyond the previous norm due to the fear of healthcare professionals also contracting the virus. Patients with COVID-19 have frequent re-intubations and a median stay duration of 17 days.

Objectives

- Identify possible association between COVID-19 diagnosis and tracheal stenosis occurrence.
- Present a comprehensive review comparing data for length of hospital stay and COVID-19 diagnosis for tracheostomy patients..

Methods

- Data was collected from OUHSC health record systems including: Meditech, PACS, and EMR systems.
- Data was queried for length of hospital stay and COVID-19 diagnosis for tracheostomy patients from 2019 to 2022.
- Data analyses were performed using JMP/SAS/R statistical packages.

Results

	American Indian or Alaska Native	Asian	Black or African America n	Other	White
Cases	103	25	236	98	1142
Sex (M:F)	54:49	15:10	125:111	65:33	699:443
Age	50±16	51±15	52±15	53±16	54±16

Table 1. Total Tracheostomy Patient Demographics. There was no significant difference observed in age across the groups. Data shown as Mean ± SD.

Results (cont.)

	American Indian or Alaska Native	Asian	Black or African American	Other	White
Cases	24/103 (23%)	3/25 (12%)	50/236 (21%)	26/98 (26%)	246/1142 (22%)
Age	55±15	45±20	57±16	52±15	61±15
Sex (M:F)	31% : 14%	13% : 10%	20% : 23%	27% : 24%	23% : 20%
% w/ COVID (M:F)	29% : 42%	0% : 100%	32% : 28%	28% : 25%	20% : 20%
Total % w/ COVID	33%	33%	30%	27%	20%

Table 2. Total Expired Tracheostomy Patient Demographics. There was no significant difference observed in age across the groups. Data shown as Mean ± SD.

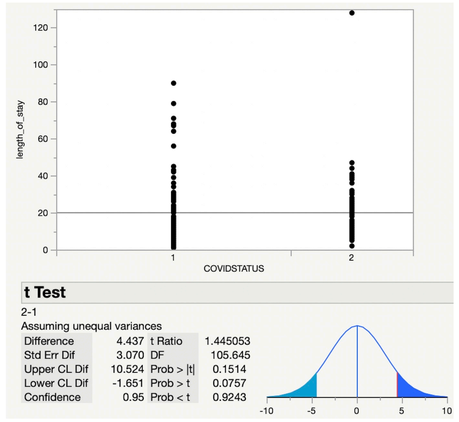

Figure 2. Total Expired Males: Length of Stay vs COVID Status. 1 = Neg. 2 = Pos

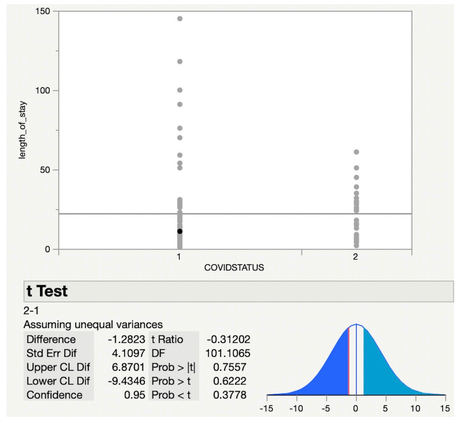

Figure 3. Total Expired Females: Length of Stay vs COVID Status. 1 = Neg. 2 = Pos

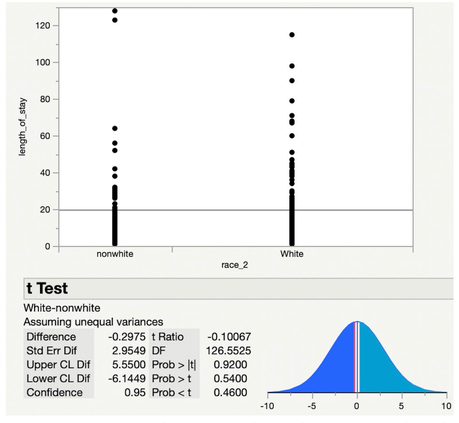

Figure 4. Total Expired Males: Length of Stay vs Race

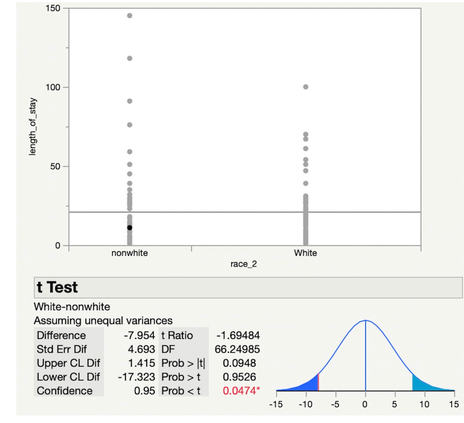

Figure 5. Total Expired Females: Length of Stay vs Race

Conclusion

- From 11/29/2019 to 12/18/2022, there were 1644 tracheostomy patients identified where 367 of those expired (22.3%).
- No significant differences on length of stay between whites and non-whites that expired when covid status factored in.
- The data did however significantly suggest that white females expired almost 8 days quicker than non-white females. ($P < 0.0474$).

Future Work

- In the future, looking at prior or current comorbidities/toxin exposure to see what effect either might have had on patient outcomes along with covid is warranted for future literature.
- Performing a multivariant analysis incorporating a specific tracheal stenosis cpt code.
- Identifying how many times each patient was intubated as multiple intubations further increases risk for stenosis.

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