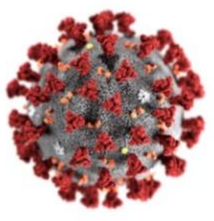


A Cross-sectional observational study of endotracheal intubation and extubation practices amongst doctors treating adult COVID-19 patients in South Africa



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Introduction

Patients diagnosed with severe 2019 Coronavirus Disease (COVID-19) may require endotracheal intubation. Unique adjustments to endotracheal intubation and extubation practices are necessary to decrease the risk of SARS-CoV-2 transmission to health care workers whilst avoiding complications of airway management.

We investigated the practice of endotracheal intubation and extubation, resources available and complications encountered by clinicians performing endotracheal intubation and extubation of COVID-19 patients in South Africa.

Methods

A cross-sectional observational study was conducted during the initial surge of COVID-19 cases in South Africa. Data were collected by means of a self-administered questionnaire completed by clinicians in the private and public health care sectors after performing an endotracheal intubation and/or extubation of a patient with confirmed or suspected COVID-19.

Results

- Data from 135 endotracheal intubations and 45 extubations were collected.
- Haemoglobin desaturation was the most frequent complication encountered during endotracheal intubation (40%, n=54).
- Endotracheal intubations performed at private health care institutions were associated with a significantly lower complication rate of 17.5% (n=7) compared to 52.6% (n=50) in the public health care sector (p<0.001).
- Endotracheal intubations performed in theatre had the lowest complication rate of 10.4% (n=5, p < 0.001).
- Minimizing the number of intubation attempts and the use of checklists significantly reduced the frequency of complications encountered during endotracheal intubation.
- Intravenous induction technique, neuromuscular blocking agent used, intubating device used and time at which intubation was performed did not impact the incidence of complications experienced during endotracheal intubation.
- The majority of endotracheal extubations were uncomplicated (88.9%).

Conclusion

This study provides valuable insight into the resources used by clinicians and complications encountered whilst endotracheal intubations and/or extubations were performed. Data from this study may be used to guide future clinical practice and research, especially in limited resource settings.

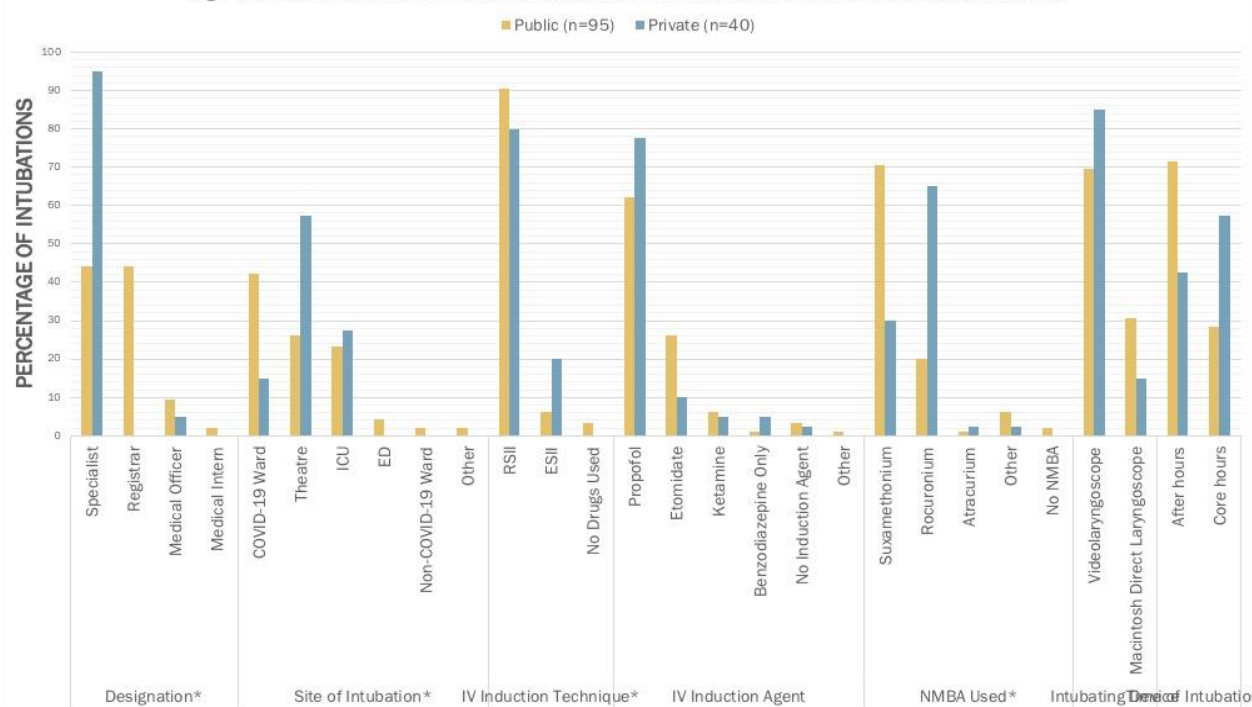
Table 1. Endotracheal Intubation Complication Rates associated with various healthcare factors

Variable	Complication Rate [Number of complicated intubations/intubations performed (%)]	p-value	Variable	Complication Rate [Number of complicated intubations/intubations performed (%)]	p-value
Designation		p = 0.825	Site of Intubation		p < 0.001*
Specialist	32/80 (40%)		Dedicated COVID-19 ward	29/46 (63%)	
Registrar	18/42 (42.9%)		ICU	16/33 (48.5%)	
Medical Officer	6/11 (54.5%)		Theatre	5/48 (10.4%)	
Medical Intern	1/2 (50%)		Emergency Department	4/4 (100%)	
Clinical Experience		p = 0.238	Non-COVID-19 ward	2/2 (100%)	
>10 years	19/54 (35.2%)		Other	1/2 (50%)	
5-10 years	15/34 (44.1%)		IV Induction Technique		p = 0.416
2-5 years	19/42 (45.2%)		RSII	50/116 (43.1%)	
< 2 years	4/5 (80%)		ESII	4/14 (28.6%)	
Health Care Sector		p < 0.001*	No Drugs Used	3/5 (60%)	
Public	50/95 (52.6%)		Modifications Used		p = 0.003*
Private	7/40 (17.5%)		Yes	46/90 (51.1%)	
SARS-CoV-2 PCR Test		p < 0.001*	No	11/45 (24.4%)	
Positive	46/80 (57.5%)		Intubating Device		p = 0.411
Unknown but highly Suspectious for COVID-19	11/55 (20%)		Videolaryngoscope	40/100 (40%)	
Use of Checklists		p = 0.013*	Macintosh Direct Laryngoscope	17/35 (48.6%)	
Yes	15/52 (28.8%)				
No	42/83 (50.6%)				

*Significant at p < 0.05

Abbreviations: SARS-CoV-2 PCR= Severe Acute Respiratory Syndrome Coronavirus 2 Polymerase Chain Reaction; COVID-19= Coronavirus Disease 2019; ICU = Intensive Care Unit; IV = Intravenous; RSII = Rapid Sequence Induction and Intubation; ESII = Elective Sequence Induction and Intubation; NMBA = Neuromuscular Blocking Agent; IBW = Ideal Body Weight

Fig 2. Differences in Endotracheal Intubation Practices between Healthcare Sectors



*Significant at p<0.05

Fig 1. Complications encountered during Endotracheal Intubation

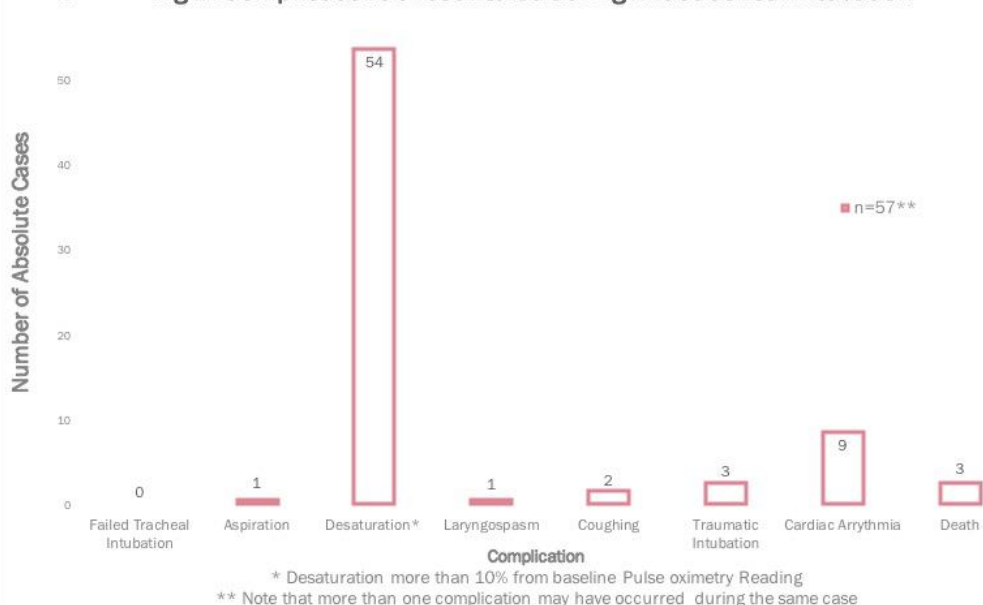


Fig 3. Personal Protective Equipment Used by Intubating Clinician

