Influence of Patient Weight on Prehospital Advanced Airway Procedure Success Rates

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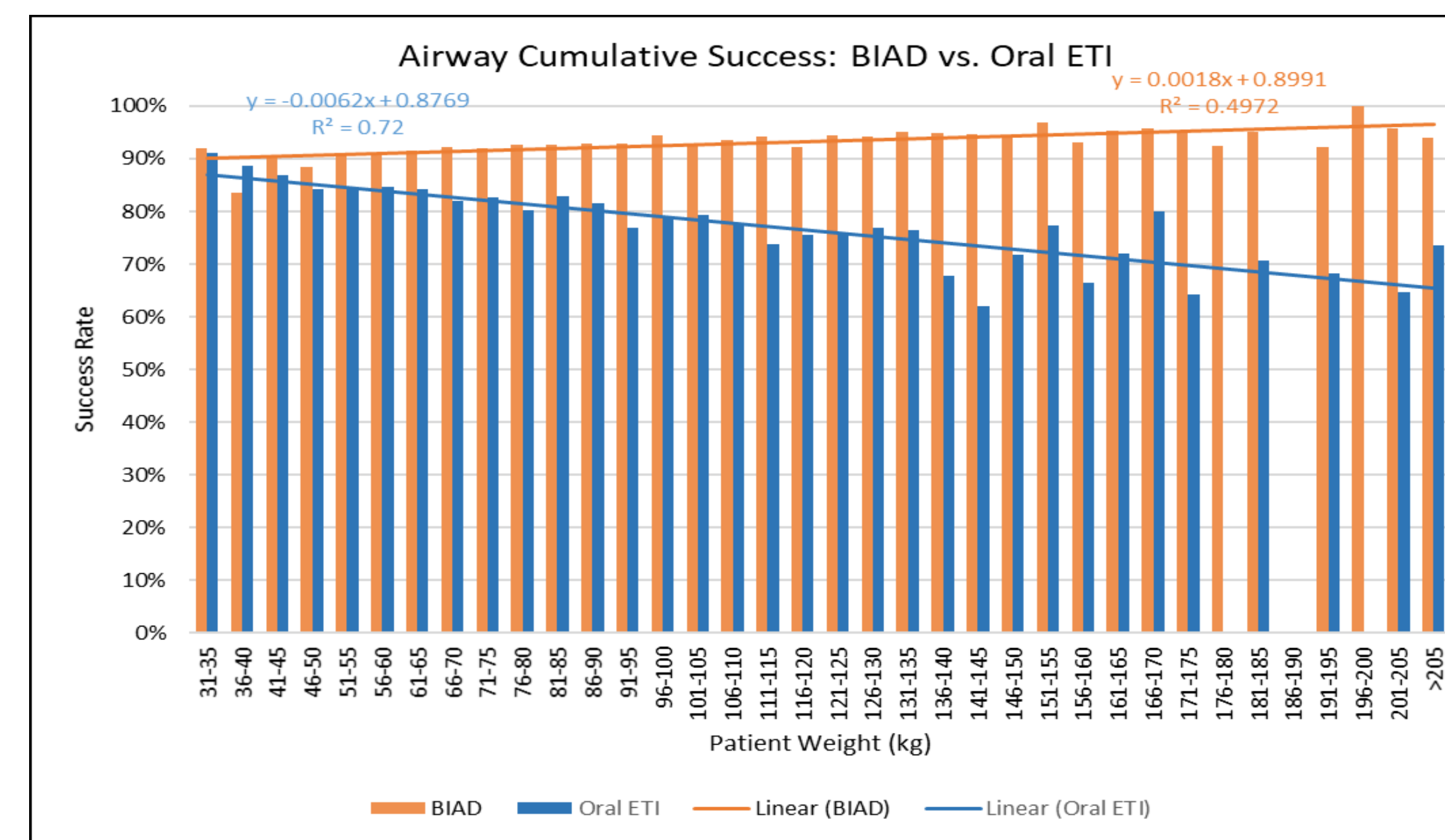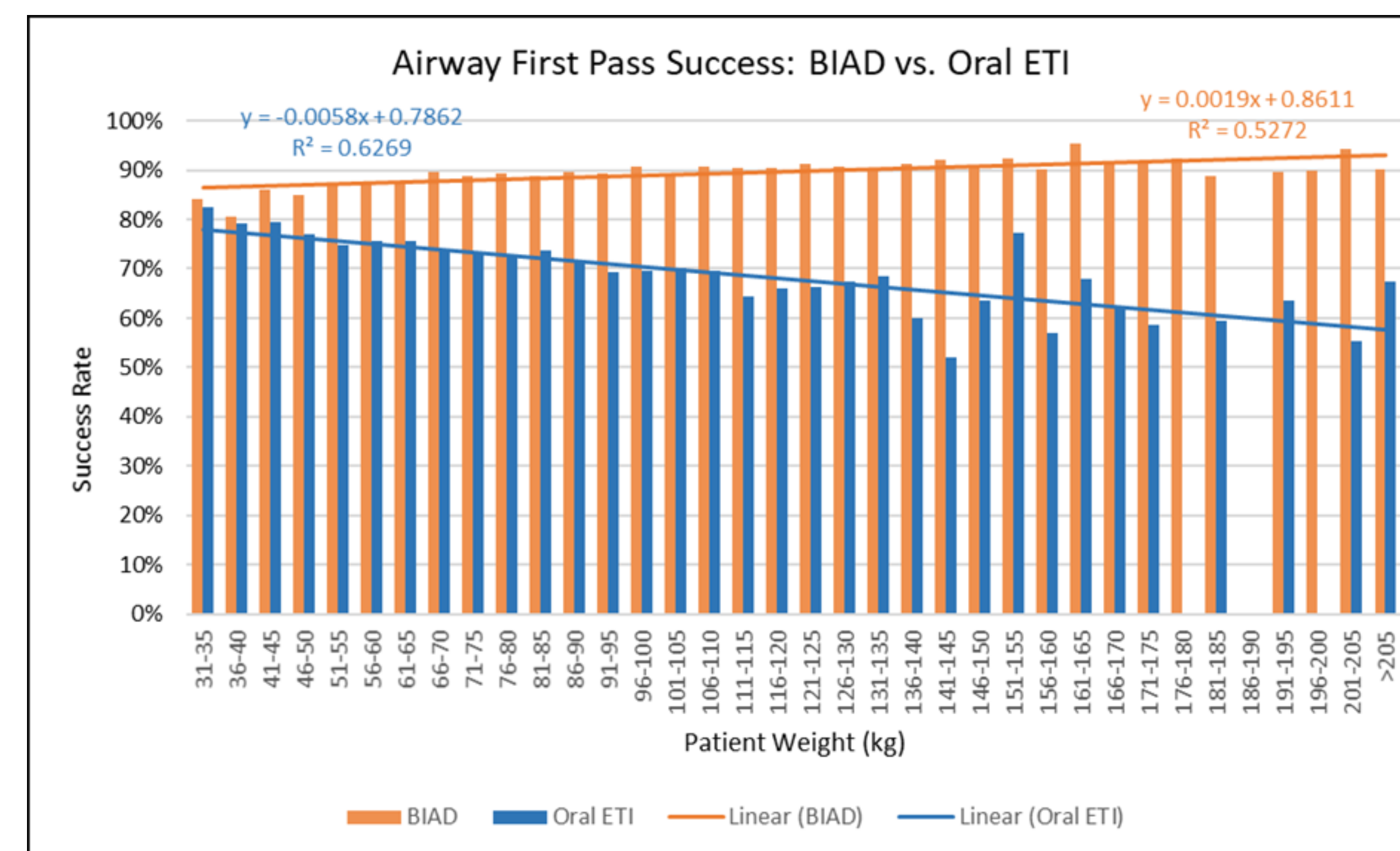**eso** Healthcare Connected

Introduction

- Previous investigations of the relationship between obesity and difficult airway management have provided mixed results.
- Almost universally, these studies were conducted in the hospital setting, and the influence of patient body weight on successful prehospital airway management remains unclear.

Study Objective

- Because patient weight could be one readily identifiable risk factor for problematic airway interventions, we sought to evaluate this relationship.

Methods

- We conducted a retrospective analysis using the 2020 ESO Data Collaborative dataset.
- The inclusion criteria consisted of adult patients weighing >30kg with an attempted orotracheal intubation (OTI) and/or blind insertion airway device (BIAD) placement.
- The BIADs of interest included the iGEL, King Airway, laryngeal mask airway (LMA), and Combitube.
- Excluded were intubations via rapid sequence induction, drug-assisted intubation, nasotracheal intubation, or video laryngoscopy.
- Separate logistic regression models were developed to determine the influence of estimated patient body weight (dichotomized at 100kg) on first attempt and cumulative procedure success for OTI and BIAD.
- Linear regression models were used to identify trends for each airway device across weight strata.

Airway First Pass Success: BIAD vs. Oral ETI

Airway Cumulative Success: BIAD vs. Oral ETI

Results

- A total of 45,344 patients met the inclusionary criteria and had complete data for analysis:
  - 61.59 (±17.89) mean years of age
  - 91.82 (±31.72) mean kg body weight
  - 38,210 (84.3%) patients experienced cardiac arrest prior to or after arrival of EMS
  - 3,130 (6.9%) with traumatic injuries
- OTI was attempted in 18,153 (40.0%) patients, 21,597 (47.6%) had a BIAD attempt, and 5,594 (12.3%) had both airways attempted.
- The overall cumulative success rate was 79.5% for OTI and 92.7% for BIAD.
- Cumulative OTI success was associated with a negative 0.6% linear trend per 5 kg of body weight (p<0.001).
- Cumulative BIAD success had a 0.2% positive trend per 5 kg of body weight(p<0.001).

Conclusion

- Increasing patient weight was negatively associated with intubation success.
- A positive, but smaller, linear trend was observed for BIAD placement.
- Patient weight may be an easily identifiable predictor of difficult intubation and may be a consideration when selecting an airway management strategy.

Limitations

- Retrospective design and unknown accuracy of estimated weights.
- No data on ventilatory performance.
- No data on patient outcomes.

	Orotracheal Intubation			BIAD		
	Odds Ratio	95% CI	p-value	Odds Ratio	95% CI	p-value
Age	1.004	1.002-1.006	<0.001	1.000	0.997-1.003	0.916
Male sex	0.843	0.787-0.902	<0.001	1.008	0.915-1.111	0.870
Minority	0.866	0.805-0.931	<0.001	1.338	1.206-1.485	<0.001
Weight (>100kg)	0.642	0.600-0.687	<0.001	1.316	1.187-1.459	<0.001
Etiology of Incident						
Medical	(reference)			(reference)		
Trauma	0.823	0.733-0.925	0.001	0.726	0.602-0.876	<0.001
Medical and Trauma	1.006	0.848-1.193	0.949	0.909	0.707-1.170	0.459