Comparison of GlideScope® and Miller Blade Laryngoscopy with Respect to POGO Scores in the Pediatric Airway

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INTRODUCTION

- Laryngoscopy and endotracheal intubation are crucial goals of airway management especially in pediatric patients.
- In pediatrics, it has generally been regarded that a straight blade (i.e., “Miller blade”) be implemented for laryngoscopy. However, the GlideScope® video laryngoscope is an airway tool that is often used as well, especially with potentially difficult airways. Research in adults has shown the GlideScope® confers equal or superior glottic views compared to curved blades 1-3.
- Using curved blades in pediatrics has been shown to be less effective in the control the epiglottis, which may result in poorer visualization of the glottic structures compared to its straight (i.e., “Miller”) blade counterpart.
- This research compared the percentage of glottic opening (POGO) scores between Miller blade and GlideScope® in children having endotracheal intubation.
- The purpose of this research was to assess the criterion validity of the GlideScope® by comparing the correlation between it and the Miller blade assessments of glottis visibility in pediatric patients.

METHODS

- Observations were made on 50 pediatric patients (age = 6 months - 4 years) undergoing general anesthesia with endotracheal intubation.
- Prior to intubation, the anesthesiologist visualized the airway using both the Miller blade and the GlideScope®, and gave a POGO score. Visualization order was randomly assigned.
- The criterion validity of the GlideScope® was evaluated by calculating the correlation between the GlideScope® and the Miller blade measurements using the POGO score.

RESULTS

Demographics

- For the study group (n=50), the mean age and weight were 22.1 ± 13.0 months (range: 6 - 47) and 11.6 ± 3.0 kilograms (range: 5.4 - 17.8), respectively.

POGO Measurements

- The Miller blade tended to estimate smaller openings on average; however, both distributions tend towards the maximum opening of 100. The differences between methods was statistically significant (p<0.001).
- Four outliers were excluded after data collection due to the significant discrepancy in agreement (>40% difference in POGO scores). The primary analysis does not include these outliers. The mean POGO score was 84.8 ± 18.3 and 92.8 ± 15.0 for the Miller blade and GlideScope®, respectively.
- The GlideScope® size was 2.5 in 68% (n=34) of subjects and 2.0 in 32% (n=16) of subjects. The Miller blade size was 2.0 in 80% (n=40) of subjects and 1.0 in 20% (n=10) of subjects.

Measurements of Agreement

- Regression analysis indicated no significant effect of age, weight, order of procedure and size of instrument on correlation coefficients.
- The concordance correlation coefficient was 0.69 with a 95% confidence interval of 0.55 – 0.84 (p<0.001). This measure of correlation suggests strong agreement. The mean difference between measurements was 4.8% (± 1.9).

Scatter Plot: Depicts agreement between the GlideScope® and Miller blade POGO scores (n=46). The fact that the fitted line lies above the measure of perfect concordance indicates that the GlideScope® overestimates scores compared to the Miller blade on average.

- The Bland-Altman limits of agreement (n=46) suggest that the GlideScope® measurement will be within -18.6% and 28.2% of the Miller blade POGO score 95% of the time. This represents the most extreme difference between the measurement methods. Such differences, if that extreme, would not meaningfully affect the clinical interpretation of the results.

DISCUSSION

1. Results show strong agreement between measurements of the glottic opening between the Miller blade and the GlideScope®.
2. The limits of agreement are within a clinically acceptable range. Thus, it appears that it is acceptable for a clinician to use either the Miller blade or the GlideScope® as a modality to assist with intubation in pediatric patients.

References


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