Section: Anaesthesiology

Original Research Article

COMPARATIVE STUDY OF TASCOPE WITH GLIDESCOPE IN EASE OF INTUBATION AND HAEMODYNAMIC CHANGES: A RANDOMISED CONTROLLED TRIAL

Abhishek Chaudhary[1], Asma Rahat[2], Sayeedurrehman[3], Sarfaraz Ahmed[4], Bhawna Singh[5]

[1]3rd year Post Graduate, Department of Anaesthesiology, Rohilkhand Medical College & Hospital, Bareilly, Uttar Pradesh India.
[4,5]Professor, Department of Anaesthesiology, Rohilkhand Medical College & Hospital, Bareilly, Uttar Pradesh India.
[2,3]Assistant Professor, Department of Anaesthesiology, Rohilkhand Medical College & Hospital, Bareilly, Uttar Pradesh India.

Received *: 31/01/2025*
Received in revised form *: 10/04/2025*
Accepted *: 27/04/2025*

Corresponding Author:
Dr. Abhishek Chaudhary,
3rd year Post Graduate, Department of Anaesthesiology, Rohilkhand Medical College & Hospital, Bareilly, Uttar Pradesh India.
Email: abhidshek0@gmail.com

DOI: 10.70034/ijmedph.2025.2.186

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2025; 15 (2); 1024-1032

ABSTRACT

Background: Endotracheal intubation is a critical procedure routinely performed in various clinical settings, including operating rooms, intensive care units, and emergency departments. It serves as a cornerstone in securing the airway during anaesthesia, resuscitation, and management of critically ill patients. **Objective:** To study the comparative effectiveness and safety of the TAScope and GlideScope in endotracheal intubation.

Materials and Methods: This Randomized controlled study was conducted among patients who were posted for elective surgery across different specialties in Department of Anaesthesiology, Rohilkhand Medical College and Hospital, Bareilly after obtaining Institutional Ethical Committee's approval. Duration of study was one year from August 2023 to July 2024.

Results: Both TAScope and GlideScope showed comparable usage across different age groups and gender distributions, with no significant bias in device selection related to these factors. The number of intubation attempts was not significantly associated with the device used, though TAScope had a higher first-attempt success rate, and GlideScope was used more frequently in cases requiring three attempts. The incidence of trauma was similar between TAScope and GlideScope groups, The TAScope group showed a preference for use in ASA Grade II patients, while GlideScope was used more frequently in ASA Grade I patients. Mallampati grade did not significantly influence device selection. Heart rate, systolic blood pressure (SBP), diastolic blood pressure (DBP), and mean arterial pressure (MAP) demonstrated significant differences post- intubation, with TAScope showing higher hemodynamic responses in the initial minutes, which normalized within 10 minutes. SpO_2 levels were consistently maintained above 96% in both groups, with no significant differences. GlideScope significantly reduced intubation time compared to TAScope, Post-operative sore throat scores were higher in the TAScope group at alltime points. Intubation Difficulty Scores were significantly lower for the GlideScope group.

Conclusion: GlideScope generally provides a more efficient and smoother intubation process. GlideScope may be the preferred choice in clinical settings that prioritize hemodynamic stability, where minimizing the physical strain on the patient during intubation is essential.

Keywords: TAScope, Glidescope, intubation, haemodynamic changes.

INTRODUCTION

The success of intubation is paramount as failure can lead to severe complications, including hypoxemia, aspiration, and even mortality. Traditionally, direct laryngoscopy has been the primary method for endotracheal intubation.

However, technological advancements have led to the development of various video laryngoscopes like McGrath, King Vision, C-MAC, Airwayscope, Airtraq, TAScope and GlideScope, which aim to improve the ease of intubation and reduce associated complications. The TAScope and GlideScope are newer video laryngoscopes that provide real-time video images of the larynx during intubation, potentially enhancing the visualisation of the glottis and improving the success rate of intubation, especially in difficult airway situations.[1] The TAScope[2] is a relatively newer device, whereas the GlideScope has been more extensively studied and is widely used in clinical practice. Both devices claim to offer superior laryngoscopic views, facilitate intubation with fewer attempts, and reduce intubation-associated trauma.

However, there is a need for a direct comparison between these two devices to ascertain their relative effectiveness and safety profiles, particularly concerning ease of intubation and hemodynamic changes during the procedure. This study focuses on assessing and comparing various parameters associated with endotracheal intubation using TAScope and Glide Scope in a randomised controlled trial. The parameters of interest include the number of intubation attempts required for successful intubation, the intubation difficulty score, laryngoscopy and intubation time, laryngoscopic view as determined by the POGO (Percentage of Glottic Opening) score, any airway trauma during intubation, hemodynamic changes, and the incidence of postoperative sore throat within 24 hours. These parameters are crucial in evaluating the clinical utility and safety of the devices. One of the primary concerns during intubation is the number of attempts required to secure the airway.

The TAScope and GlideScope, with their enhanced visualisation capabilities, may reduce the time required to visualise the glottis and successfully place the endotracheal tube, thus improving patient safety.[3] The laryngoscopic view, as measured by the POGO score, provides a quantitative assessment of the glottic exposure during laryngoscopy. A higher POGO score indicates a better view of the glottis, which is associated with higher intubation success rates. Both TAScope and GlideScope are expected to provide superior glottic views compared to traditional laryngoscopy, but direct comparison is necessary to determine if one device offers a significant advantage over the other.[4]

By comparing the incidence of sore throat within 24 hours post-intubation between the two devices, this study will provide valuable information on patient comfort and the overall gentleness of the intubation process. This study is necessary to fill the existing knowledge gap regarding the comparative effectiveness and safety of the TAScope and GlideScope in endotracheal intubation. The findings will not only contribute to the body of evidence on video laryngoscopy but also guide clinicians in selecting the most appropriate device for their patients, ultimately improving patient outcomes and safety.[5]

MATERIALS AND METHODS

This Randomized controlled study was conducted among patients who were posted for elective surgery across different specialties in Department of Anaesthesiology, Rohilkhand Medical College and Hospital, Bareilly after obtaining Institutional Ethical Committee's approval. Duration of study was one year from August 2023 to July 2024

Patients were divided in two groups-

Group 1: Intubation done using TAScope in patients who underwent elective surgeries under GA

Group 2: Intubation done using GlideScope in patients who underwent elective surgeries under GA

Sample Size: In this study, patients were randomly divided into two groups to do the comparison. Sample size is taken to be 43 in each group as per statistical calculations which is done by using the software - Power and Sample size program.[6]

Inclusion Criteria

Patients fulfilled the following criteria:

1. American Society of Anesthesiologist (ASA) grade I or II.[7]
2. Aged between 18-60 years of either sex.
3. BMI <30 kg/m².
4. Scheduled for elective surgery across different specialties.
5. All grades of Mallampati classification.[8]

Exclusion Criteria

1. Anticipated difficult airway, defined as thyromental distance <6 cm, inter-incisor distance <2.5 cm, or a history of difficult airway management in the past.
2. Any pathology of the oral cavity that could obstruct the insertion of the device.

Methodology

CTRI registration was obtained for the study. Informed and written consent for participation was secured from each patient. A thorough pre-anesthetic check-up and detailed airway assessment was performed. Patients were randomly divided into two groups, Group "1" and Group "2," using a computer-generated technique. In Group "1," the TAScope was used for intubation, while in Group "2," the GlideScope was used.

An intravenous line was secured, fluids were started, and baseline readings were taken after attaching the monitors. Premedication was administered with an intravenous injection of Midazolam 0.03 mg/kg, Glycopyrrolate 0.005 mg/kg, and Butorphanol 0.02 mg/kg. A standard anesthetic technique was utilized, which included preoxygenation with 100% oxygen for 3 minutes. Induction was carried out using an intravenous injection of Propofol 2 mg/kg. Adequate muscle relaxation was achieved using an intravenous injection of Succinylcholine 1.5 mg/kg was administered, followed by intubation using the

designated device (TAScope or GlideScope) based on the group assignment.

Successful placement of the endotracheal tube was confirmed by the presence of a square waveform on end-tidal CO_2 ($EtCO_2$) monitoring. Each group was allowed a maximum of three attempts at intubation; in the event of unsuccessful intubation, fiberoptic-guided intubation was performed. The indices related to laryngoscopy were observed and recorded in the designated proforma.

Heart rate, systolic blood pressure, diastolic blood pressure, mean arterial blood pressure, and arterial O_2 saturation were recorded before induction, immediately after intubation, and at 1 minute, 3 minutes, 5 minutes, and 10 minutes following intubation. Maintenance was carried out with O_2 and N_2O in a 40:60 ratio, Isoflurane, and intermittent administration of Inj. Vecuronium.

At the completion of the surgery, the neuromuscular block was reversed with an intravenous injection of Neostigmine 0.05 mg/kg and an intravenous injection of Glycopyrrolate 0.01 mg/kg. Pharyngo-tracheal suctioning was performed before extubation. After extubation the amount of blood loss and fluids administered were assessed. Once the patient was able to keep their eyes open, lift their head, and breathe normally, they were transferred to the Post-Anesthesia Care Unit (PACU). After 4 hours, the patient was shifted to the ward. Any complications, side effects, and adverse effects up to 24 hours postoperatively were documented.

The patients was asked about postoperative sore throat upon being transferred to the recovery room and at 2, 4, 6, 12, and 24 hours postoperatively and POST grading was recorded by an independent observer.

POGO SCORING (percentage of glottic opening),[9]

POGO	Glottic visualisation
0%	No glottic structure not even arytenoid visible
33%	Only lower 3rd of the vocal cords and arytenoids seen
100%	Entire glottic aperture visualised.

POST (post-operative sore throat) Grade[10]

1. Grade 0 - No sore throat.
2. Grade 1 - Mild sore throat (Complains only on asking)
3. Grade 2 – Moderate sore throat (Complains on his/her own)
4. Grade 3 – Severe sore throat (change of voice or hoarseness associated with throat pain)

INTUBATION DIFFICULTY SCALE,[11]

PARAMETER	SCORE	CALCULATIONS
Number of intubation attempts >1	N1	Every additional attempt adds 1 point
Number of involved Anaesthesiologists >1	N2	Every additional anesthesiologist adds 1 point
Number of alternative techniques*	N3	Each technique adds 1 point
Cormack-Lehane grade	N4	N4=grade at first attempt-1 If successful blind intubation N4 = 0
Required lifting force	N5	Normal;N5=0, Required;N5=1
Required laryngeal pressure	N6	No;N6=0, Required;N6=1
Vocal cord mobility	N7	Abduction;N7=0, Adduction;N7=1

Statistical Analysis

The data from the present analysis was systematically collected, compiled, and statistically analyzed. Descriptive & inferential statistical analysis were derived from results on continuous measurements, conferred as mean ± SD while results on categorical measurements were presented in numbers (%age). The data were entered on a Microsoft Excel spreadsheet and imported into Statistical Package for Social Sciences (SPSS) version 23 for statistical analysis. Qualitative data was present in frequency and percentage and quantitative data was presented in mean and standard deviation. A chi- square test was performed to find associations in different variables between the 2 groups, and student independent t-test was performed to find significant differences in mean in different variables among the two groups. The p-value was taken significant when less than 0.05 ($p<0.05$) and Confidence interval of 95% was taken.

RESULTS

The distribution across age groups shows slight variations; for example, in the 21-30 and 41- 50 age groups, TAScope was used slightly more frequently (53.8% and 57.1%, respectively). In contrast, GlideScope use was more common among patients aged 31- 40 (63.2%). An equal distribution (50.0%) was noted in the 51-60 age group, suggesting balanced device usage in older patients. There is no statistically significant association between age groups and the choice of device. This suggests that the decision to use TAScope or GlideScope was independent of the patient's age, reflecting unbiased selection or random distribution across the different age categories.

Of the total sample, 42 were male (48.8%) and 44 were female (51.2%). TAScope was used more frequently in males (57.1%) compared to GlideScope (42.9%), while females showed a higher usage of GlideScope (56.8%) than TAScope (43.2%). Gender did not influence the choice of intubation device, and the distribution of TAScope and GlideScope among male and female patients appears to be due to random variation rather than a systematic preference.

Both groups show identical mean heights (171 cm), with confidence intervals overlapping significantly (TAScope: 167.4–174.6; GlideScope: 167.3–174.8), indicating no meaningful difference. Similarly, the mean weight for TAScope is 62.4 kg (CI: 59.9–

64.9) and for GlideScope is 63 kg (CI: 60.2–65.8), with p = 0.743, showing no statistical significance. The BMI comparison also yields similar results, with TAScope having a mean of 24.4 (CI: 23.5–25.4) and GlideScope 24.1 (CI: 23.1–25.2), and a non-significant p-value of 0.688.

In the first attempt, GlideScope was more frequently used (60.5%) compared to TAScope (39.5%). However, it was observed that for the third attempt, TAScope usage increased significantly, accounting for 80.0% of cases. The usage of TAScope and GlideScope was relatively balanced for patients requiring two attempts (57.9% vs. 42.1%). There is no statistically significant relationship between the number of attempts and the device used.

TAScope usage was associated with slightly higher incidence of trauma accounting for (51.2%) than GlideScope (48.8%) out of 41 patients that received trauma. With GlideScope usage 51.1% of cases did not received any trauma compared to 48.9% for TAScope. There is no statistically significant association between trauma status and the choice of device.

Table 1: Distribution of study subjects according to ASA Grade

	Group		
ASA Grade	**TAScope**	**GlideScope**	**Total**
I	16 (39.0%)	25 (61.0%)	41 (47.7%)
II	27 (60.0%)	18 (40.0%)	45 (52.3%)
Total	**43 (50.0%)**	**43 (50.0%)**	**86 (100%)**

GlideScope was used more frequently (61.0%)in ASA Grade I patients, thanTAScope (39.0%). Conversely, TAScope was predominantly used in ASA Grade II patients (60.0%) compared to GlideScope (40.0%). The chi-square (χ^2) value of 3.78 and a p-value of 0.052 suggest that the association between ASA grade and device choice is marginally non-significant. While the p-value is slightly above the conventional threshold of 0.05, it indicates a potential trend in device preference based on ASA grade, warranting further investigation with a larger sample to determine if these observed differences hold statistical significance.

Table 2: Distribution of study subjects according to Mallampati Grade

	Group		
Mallampati Grade	**TAScope**	**GlideScope**	**Total**
1	9 (39.13%)	14 (60.87%)	23 (26.74%)
2	13 (59.09%)	9 (40.91%)	22 (25.58%)
3	13 (46.43%)	15 (53.57%)	28 (32.56%)
4	8 (61.54%)	5 (38.46%)	13 (15.12%)
Total	**43 (50.0%)**	**43 (50.0%)**	**86 (100%)**

GlideScope was used more frequently (60.87%) in ASA grade I patients thanTAScope (39.13%). In contrast, TAScope was more commonly used for Grade 4 patients (61.54%). For Grade 2 and 3 patients, the usage showed no strong preference for one device over the other, with TAScope used slightly more in Grade 2 (59.09%) and GlideScope more in Grade 3 (53.57%). The chi-square (χ^2) value of 2.65 with a p-value of 0.449 indicates no statistically significant association between Mallampati grade and the choice of device, suggesting that both devices were employed across all levels of airway difficulty without a consistent preference influenced by Mallampati grade. This implies that factors other than airway visibility might have guided the selection of devices, or that both devices are considered equally effective across different Mallampati grades.

Initially, heart rates are nearly identical pre-induction, with no significant difference observed between TAScope (69.4 bpm) and GlideScope (69.8 bpm, p=0.546). Immediately after intubation, significant differences emerge, with TAScope showing a substantially higher mean heart rate (91.3 bpm) compared to GlideScope (78.9 bpm, p<0.001). This trend persists at 1 minute and 3 minutes post-intubation, with TAScope displaying higher mean heart rates (88 bpm and 79.6 bpm, respectively) than GlideScope (77.7 bpm and 73.3 bpm, p<0.001).

At 5 minutes, the difference in heart rates narrows, with TAScope at 74.8 bpm and GlideScope at 70.4 bpm, though this remains statistically significant (p<0.001). By 10 minutes post-intubation, heart rates converge, with TAScope at 69.6 bpm and GlideScope at 69.8 bpm, showing no significant difference (p=0.809). These findings suggest that TAScope is associated with a stronger acute hemodynamic response immediately after intubation, characterized by higher heart rates compared to GlideScope. However, this effect diminishes over time, with heart rates equalizing by 10 minutes post-intubation.

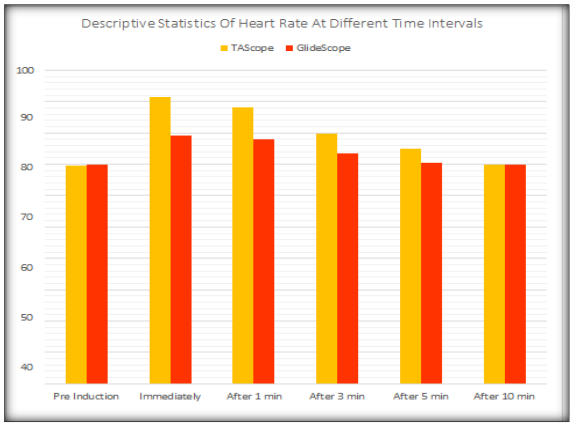

Figure 1: Descriptive statistics of heart rate at different time intervals

The data shows that pre-induction SBP is the same for both groups at 128 mmHg, with similar confidence intervals (TAScope CI: 126–129, GlideScope CI: 124–131) and no significant difference (p=0.98). Immediately after intubation, TAScope's mean SBP increases significantly to 141 mmHg (CI: 139–143) compared to GlideScope at 130 mmHg (CI: 127–133), with a p-value of less than 0.001. This pattern continues at 1 minute, with TAScope recording a mean SBP of 138 mmHg (CI: 136–140) compared to GlideScope's 129 mmHg (CI: 126–132, p<0.001). The trend persists at 3 minutes, where TAScope maintains a higher SBP of 136 mmHg (CI: 134– 138) compared to GlideScope at 129 mmHg (CI: 125–132, p<0.001), and at 5 minutes, where TAScope reaches 140 mmHg (CI: 139–142) while GlideScope decreases to 127 mmHg (CI: 124–131, p<0.001). By 10 minutes post-intubation, SBP values begin to align, with TAScope at 131 mmHg (CI: 128–134) and GlideScope at 128 mmHg (CI: 125–131), and the difference is no longer statistically significant (p=0.117). These findings indicate that TAScope induces a higher SBP shortly after intubation, with significant differences observed within the first 5 minutes. However, by 10 minutes post- intubation, SBP stabilizes and aligns with GlideScope readings, suggesting that initial hemodynamic responses differ between the two devices but converge over time.

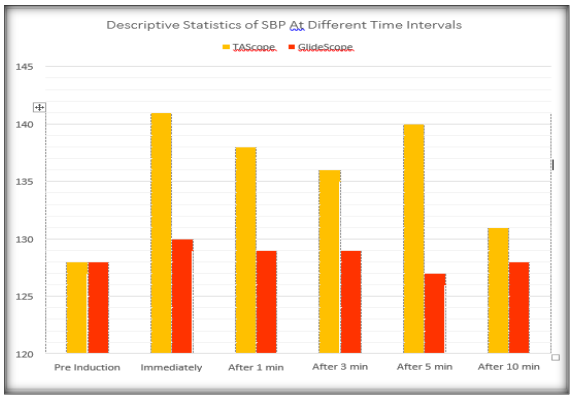

Figure 2: Descriptive statistics of SBP at different time intervals

Initially, pre-induction DBP is slightly lower in the TAScope group at 80.6 mmHg (CI: 78.1–83.1) compared to the GlideScope group at 82.9 mmHg (CI: 80.7–85.0), but this difference is not statistically significant (p=0.163). Immediately after intubation, TAScope shows a significantly higher DBP of 89.2 mmHg (CI: 87.1– 91.3) compared to GlideScope's 83.9 mmHg (CI: 81.8–86.1, p<0.001). At 1 minute post- intubation, TAScope maintains a higher DBP at 87.6 mmHg (CI: 85.4–89.8) compared to GlideScope's 83 mmHg (CI: 80.8–85.2, p=0.003). This trend continues at 3 minutes and 5 minutes post-intubation, with TAScope showing DBP values of 86.3 mmHg (CI: 84.5–88.1) and 85.4 mmHg (CI: 83.2–87.5), respectively, compared to GlideScope values of 83.1 mmHg (CI: 80.7–85.5) and 82.5 mmHg (CI: 80.5–84.5). The differences remain statistically significant with p-values of 0.038 and 0.05, respectively. By 10 minutes post-intubation, the DBP for TAScope decreases to 80.4 mmHg (CI: 77.7–83.0), aligning closely with GlideScope's DBP of 83.1 mmHg (CI: 80.9–85.3), with no significant difference observed (p=0.117). These findings indicate that TAScope tends to induce a higher DBP shortly after intubation, with significant differences observed within the first 5 minutes. However, by 10 minutes post-intubation, DBP levels stabilize and align with those of GlideScope, suggesting that initial hemodynamic responses differ but equilibrate over time.

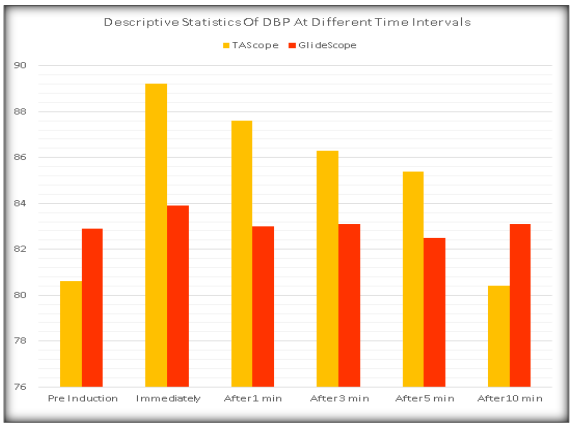

Figure 3: Descriptive statistics of DBP at different time intervals

Initially, pre-induction MAP is slightly lower in the TAScope group at 96.3 mmHg (CI: 94.5–98.0) compared to the GlideScope group at 97.8 mmHg (CI: 96.0–99.5). However, this difference is not statistically significant (p=0.229). Immediately after intubation, MAP rises significantly in the TAScope group to 106.4 mmHg (CI: 104.9–108.0), compared to 99.3 mmHg (CI: 97.5–101.2) in the GlideScope group, with a p-value of less than 0.001. At 1 minute post-intubation, TAScope maintains a higher MAP of 104.5 mmHg (CI: 102.9–106.1), while GlideScope records 98.2 mmHg (CI: 96.4–100.1), with the difference remaining statistically significant

(p<0.001). At 3 and 5 minutes post-intubation, the trend continues, with TAScope showing MAP values of 102.8 mmHg (CI: 101.4–104.1) and 103.7 mmHg (CI: 102.2–105.3), respectively. In comparison, GlideScope records 98.2 mmHg (CI: 96.1–100.4) and 97.4 mmHg (CI: 95.7–99.2) at these time points. The differences remain significant, with p-values of less than 0.001. By 10 minutes post-intubation, MAP values converge, with TAScope recording 97.3 mmHg (CI: 95.2–99.4) and GlideScope 98 mmHg (CI: 96.3–99.8). The difference at this point is no longer statistically significant (p=0.598). These findings suggest that TAScope induces a significantly higher MAP shortly after intubation, with notable differences observed up to 5 minutes post-intubation. However, MAP values stabilize and align closely between the two groups by 10 minutes, indicating that the initial hemodynamic impact diminishes over time.

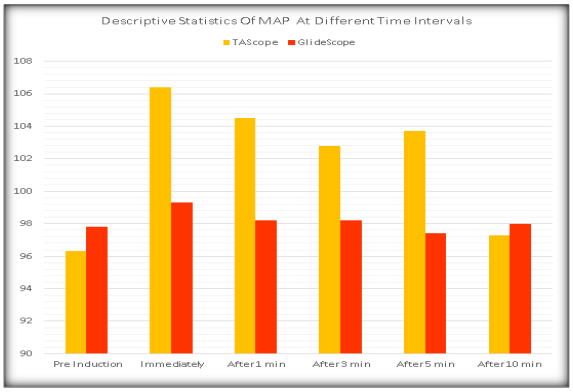

Figure 4: Descriptive statistics of MAP at different time intervals

Table 3: Descriptive statistics of SpO2 at different time intervals

			95% Confidence Interval			
SpO2	**Group**	**Mean**	**Lower**	**Upper**	**SD**	**p value**
Pre Induction	TAScope	96.7	96.3	97.2	1.4	0.822
	GlideScope	96.8	96.4	97.3	1.47	
After Induction	TAScope	96.7	96.3	97.2	1.4	0.822
	GlideScope	96.8	96.4	97.3	1.47	

The mean SpO_2 levels were nearly identical between the two groups. Pre-induction SpO_2 in the TAScope group was 96.7% (CI: 96.3–97.2), while in the GlideScope group, it was 96.8% (CI: 96.4–97.3). Similarly, after induction, the TAScope group maintained a mean SpO_2 of 96.7%, and the GlideScope group recorded 96.8%, with identical confidence intervals. The p-values (0.822) at both time points confirm no statistically significant difference between the devices. These findings indicate that both TAScope and GlideScope perform equally well in maintaining optimal oxygen saturation levels, with no meaningful impact on SpO_2 resulting from the choice of device.

Table 4: Distribution of Intubation Time

	Group			
Intubation Time (sec)	**TAScope**	**GlideScope**	**Total**	**P value**
<15 sec	1 (50%)	1 (50%)	2 (2.3%)	0.042
15-25 sec	3 (20%)	12 (80%)	15 (17.4%)	
25-40 sec	20 (50%)	20 (50%)	40 (46.5%)	
≥40 sec	19 (65.5%)	10 (34.5%)	29 (33.7%)	
Total	43 (50%)	43 (50%)	86 (100%)	
Mean ± SD	40.1 ± 13.14	32.8 ± 8.39		

The data indicates a statistically significant difference in intubation times (P = 0.042). In the <15 seconds category, both TAScope and GlideScope facilitated intubation equally (1 case each, 50%), contributing to 2.3% of the total cases. For the 15-25 seconds range, GlideScope showed a higher efficiency with 12 cases (80%) compared to TAScope's 3 cases (20%), comprising 17.4% of the total. In the 25-40 seconds interval, both devices were equally effective, with 20 cases each (50%), representing the largest proportion (46.5%) of cases. However, in the ≥40 seconds category, TAScope required more time in 19 cases (65.5%), compared to GlideScope's 10 cases (34.5%), accounting for 33.7% of total cases. The mean intubation time was notably longer for TAScope (40.1 ± 13.14 seconds) compared to GlideScope (32.8 ± 8.39 seconds). These findings suggest that GlideScope generally enables faster intubation times, particularly in shorter duration categories, while TAScope is associated with longer intubation durations in a significant proportion of cases.

Table 5: Descriptive statistics of POGO Score

			95% Confidence Interval			
	Group	**Mean**	**Lower**	**Upper**	**SD**	**p value**
POGO Score	TAScope	40.8	34.1	47.5	21.73	1.0
	GlideScope	40.8	34.1	47.5	21.73	

Both devices demonstrated identical mean POGO scores of 40.8, with the 95% confidence interval ranging from 34.1 to 47.5, indicating similar precision and consistency in glottic visualization. The standard deviation (SD) for both groups was also the same at 21.73, suggesting comparable variability in the scores. The p-value of 1.0 confirms no statistically significant difference between the groups, signifying that both TAScope and GlideScope offer equivalent performance in terms of glottic exposure during intubation. This equivalence in POGO scores implies that either device can be utilized interchangeably for achieving adequate glottic visualization.

There is a noticeable trend of higher sore throat scores with TAScope, these differences do not reach statistical significance, indicating that both devices may similarly influence post-operative sore throat over the 24-hour observation period, contrary to initial appearances. the GlideScope may be associated with less difficulty during intubation as compared to the TAScope, potentially making it a more favorable option in clinical settings where ease of intubation is critical.

DISCUSSION

There was no significant difference in age distribution between the two groups (χ^2=1.90, p=0.754). These findings are in alignment with Jafra et al,[12] who reported a mean age of 40.03 ± 11.884 years in Group G (GlideScope) and 39.87 ± 13.419 years in Group M (Macintosh), with no statistically significant difference (p=0.929).

The difference in gender distribution between the groups was not statistically significant (χ^2=1.68, p=0.196). Jafra et al,[12] also reported no significant gender difference, with a male-to-female ratio of 33:67 in Group G and 40:60 in Group M (p=0.304).

The height, weight, and BMI of the participants in our study were comparable between the TAScope and Glidescope groups. These findings are consistent with Jafra et al,[12] who reported mean weights of 61.51 ± 10.676 kg for Group G and 60.4 ± 10.34 kg for Group M (p=0.456). Choi et al,[13] found slightly lower mean heights and weights, with 166.0 ± 8.2 cm and 64.5 ± 9.2 kg in Group G, and 162.8 ± 10.5 cm and 61.2 ± 11.7 kg in Group M, but similarly observed no significant differences between groups.

In our study, the distribution of intubation attempts between the TAScope and Glidescope groups showed no statistically significant difference (χ^2=3.72, p=0.155). The majority of intubations were completed in first attempt, with 60.5% of participants in the Glidescope group and 39.5% in the TAScope group indicatinng the GlideScope group had a higher proportion of first-attempt success compared to TAScope group. However, a larger number of participants in the TAScopegroup required three attempts (80.0%) compared to the Glidescopegroup (20.0%). The distribution of TAScope and GlideScope usage was fairly even among patients who needed two attempts (57.9% for TAScope and 42.1% for GlideScope). These results align partially with the findings of Tan B.H. et al,[14] who evaluated tracheal intubation in a simulated normal airway scenario. They reported a 100% success rate for both the GlideScope and Airway Scope, with the GlideScope achieving a median ease-of-intubation score of 2 (range 1–3), compared to 1 (range 1–2) for the Airway Scope (p=0.022).

In our study, the incidence of trauma during intubation was comparable between the TAScope and Glidescope groups, with no statistically significant difference (χ^2=0.046, p=0.829). When comparing our findings with those of Russell et al,[15] their study reported a lower overall incidence of trauma. Specifically, lip trauma was observed in 3% of cases in the Macintosh group and 8% in the GlideScope group, with no significant difference (p=0.6). Notably, no dental trauma was reported in either group (p=1.0).

In our study, the distribution of ASA grades between the TAScope and Glidescope groups showed a marginal difference, which was not statistically significant (χ^2=3.78, p=0.052). Comparing with previous studies, Jafra et al,[12] reported an 80:20 distribution for ASA Grade I and II in both Group G and Group M, with no statistically significant difference between the groups. Their findings indicate a higher prevalence of ASA Grade I patients in both groups compared to our study, where the distribution was more balanced between Grades I and II.

In our study, the distribution of participants according to the Mallampati grade showed no statistically significant difference between the TAScope and Glidescope groups (χ^2=2.65, p=0.449). When comparing our findings with those of Gunes et al,[16] their study evaluated the mean Mallampati scores in two groups using different laryngoscopes. They reported a mean Mallampati score of 1.96 ± 0.79 in Group G and 2.01 ± 0.73 in Group M, with no statistically significant difference (p=0.554). These results align with our findings, where no significant difference in Mallampati grade distribution was observed between TAScope and Glidescope groups.

Our findings are consistent with those of Gunes et al,[15] who also reported a significant post-intubation rise in HR. In their study, pre-induction HR was similar across groups (80.2 ± 10.7 bpm for Group G and 80.1 ± 11.5 bpm for Group M, p=0.947). Post-intubation, HR increased significantly in both groups, but the GlideScope group (Group G) showed a lower increase in HR (85.9 ± 13.0 bpm) compared to the Macintosh group (Group M, 91.7 ± 14.6 bpm, p=0.006). At 3 minutes post-intubation, the GlideScope group continued to exhibit a lower HR (79.3 ± 12.0 bpm) compared to the Macintosh group (83.2 ± 11.4 bpm, p=0.029). These findings align with our study, where the GlideScope group

consistently exhibited a lower increase in HR response post-intubation compared to the TAScope group.

When compared to Patel et al.[17] their study reported a rise in SBP compared to baseline values of 25.22% in Group M (Macintosh) and 11.99% in Group T (TAScope). The difference in SBP between the two groups remained statistically significant up to 6 minutes post-intubation (T6). Similarly, our study found a statistically significant difference in SBP between TAScope and GlideScope up to 5 minutes post-intubation, indicating a stronger hemodynamic response with TAScope.

Patel et al,[17] observed a rise in DBP compared to baseline values of 13.45% in Group M and 13.53% in Group T, with the difference between groups being statistically significant up to 2 minutes post-intubation (T2). Our findings align partially with Patel et al,[17] as we observed a significant difference in DBP between TAScope and GlideScope up to 3 minutes post-intubation, although the values normalized by 10 minutes in both groups.

These findings suggest that TAScope induces a higher short-term hemodynamic response, which normalizes within 10 minutes, aligning with GlideScope. When compared to Patel et al,[17] their study reported that the difference in MAP between Group M (Macintosh) and Group T (TAScope) remained statistically significant up to 2 minutes post-intubation (T2). While their findings highlight a shorter duration of significant MAP differences, our study extends this period to 5 minutes, particularly with TAScope inducing a more pronounced rise in MAP. Both studies align in observing a gradual return to baseline MAP values post-intubation.

In terms of SpO_2, our study found no significant differences between the TAScope and GlideScope groups at pre-induction (TAScope: 96.7 ± 1.4%, GlideScope: 96.8 ± 1.47%, p = 0.822) or post-induction (TAScope: 96.7 ± 1.4%, GlideScope: 96.8 ± 1.47%, p = 0.822). These results indicate that both devices maintain oxygen saturation effectively, with no impact on SpO_2 levels during the intubation process. Similarly, Patel et al,[17] reported that SpO_2 changes during the pre-intubation and post-intubation periods were not statistically significant in either group, consistent with our findings. .

In our study, the mean intubation time was significantly longer in the TAScope group (40.1 ± 13.14 seconds, CI: 36.0–44.1) compared to the GlideScope group (32.8 ± 8.39 seconds, CI: 30.2–35.3, p = 0.003). This difference reflects the relative ease of navigation and visualization provided by the GlideScope, enabling quicker intubation.

When compared to Jafra et al,[12] their findings emphasized significant differences in intubation characteristics between devices. While their study did not specifically report intubation times, it highlighted improved performance metrics for videolaryngoscopic devices like the GlideScope. Similarly, Choi et al,[13] observed that the GlideScope enabled smoother navigation and better visibility, contributing to reduced intubation time compared to traditional devices, findings consistent with our observation of GlideScope's superior efficiency.

In our study, the mean intubation time was significantly longer with the TAScope (40.1 seconds, CI: 36.0–44.1) compared to the GlideScope (32.8 seconds, CI: 30.2–35.3), with a p-value of 0.003. This indicates that the GlideScope facilitates faster intubation than the TAScope. Additionally, the standard deviation for intubation time was higher in the TAScope group (SD: 13.14) compared to the GlideScope group (SD: 8.39), suggesting more consistent performance with the GlideScope. The shorter and more predictable intubation time with GlideScope supports its efficiency in clinical practice. These findings align with studies such a Jafra et al,[12] who also observed superior performance with GlideScope in achieving efficient intubation. Although their study did not report specific intubation times, the preference for GlideScope for faster procedures is consistent with our results, further emphasizing its reliability in minimizing the time required for successful intubation.

When compared to previous studies, Jafra et al,[12] found significantly higher POGO scores with GlideScope (94.40 ± 10.476) compared to Macintosh (74.20 ± 29.514). Similarly, Choi et al,[12] reported better POGO scores for GlideScope (89.6 ± 20.0%) compared to Macintosh (67.6 ± 24.7%).

CONCLUSION

GlideScope generally provides a more efficient and smoother intubation process. The device's superior design and functionality contribute to quicker intubation times, making it particularly advantageous in scenarios where time is critical and intubation needs to be as swift and smooth as possible. Additionally, GlideScope offers a level of ease that facilitates its use, especially in complex or difficult airway situations. Despite these advantages, it is important to note that both devices—GlideScope and TAScope—deliver comparable results in terms of safety, airway visualization, and overall patient outcomes.

GlideScope may be the preferred choice in clinical settings that prioritize hemodynamic stability, where minimizing the physical strain on the patient during intubation is essential. However, the choice between GlideScope and TAScope should ultimately depend on specific clinical requirements, including the patient's condition, the level of difficulty anticipated for the intubation, and the availability of the devices. Both video laryngoscopes offer valuable benefits, and their use should be guided by the context in which they are deployed, ensuring optimal patient care and procedural success.

REFERENCES

1. Ibinson JW, Ezaru CS, Cormican DS, Mangione MP. GlideScope use improves intubation success rates: an observational study using propensity score matching. BMC anesthesiology. 2014;14:1-8.
2. Dave M. Tascope – innovative intubation aid. J Anaesth Crit Care Case Rep. 2018;4(3):9-10.
3. Bradley JS, Billows GL, Olinger ML, Boha SP, Cordell WH, Nelson DR. Prehospital oral endotracheal intubation by rural basic emergency medical technicians. Ann Emerg Med. 1998;32(1):26-32.
4. Mosier J, Chiu S, Patanwala AE, Sakles JC. A comparison of the GlideScope video laryngoscope to the C-MAC video laryngoscope for intubation in the emergency department. Annals of emergency medicine. 2013;61(4):414-20.
5. Hansel J, Rogers AM, Lewis SR, Cook TM, Smith AF. Videolaryngoscopy versus direct laryngoscopy for adults undergoing tracheal intubation. Cochrane Database of Systematic Reviews. 2022(4).
6. Charan J, Biswas T. How to calculate sample size for different study designs in medical research? Indian J Psychol Med. 2013;35(2):121-6.
7. Doyle DJ, Goyal A, Bansal P, Garmon EH. American Society of Anesthesiologists classification (ASA class). In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2020.
8. Mallampati SR, Gatt SP, Gugino LD, Desai SP, Waraksa B, Freiberger D, Liu PL. A clinical sign to predict difficult tracheal intubation; a prospective study. Canadian Anaesthetists' Society Journal. 1985; 32:429-34.
9. Levitan RM, Ochroch EA, Rush S, Shofer FS, Hollander JE. Assessment of airway visualization: validation of the percentage of glottic opening (POGO) scale. Academic Emergency Medicine. 1998;5(9):919-23.
10. Ahmed A, Abbasi S, Ghafoor HB, Ishan M. Postoperative sore throat after elective surgical procedure. J Ayub Med Coll Abbottabad. 2007;19(2):12-4.
11. Adnet F, Borron SW, Racine SX, Clemessy JL, Fournier JL, Plaisance P, Lapandry C. The intubation difficulty scale (IDS): proposal and evaluation of a new score characterizing the complexity of endotracheal intubation. Anesthesiology. 1997;87(6):1290-7.
12. Jafra A, Gombar S, Kapoor D, Sandhu HS, Kumari K. A prospective randomized controlled study to evaluate and compare GlideScope with Macintosh laryngoscope for ease of endotracheal intubation in adult patients undergoing elective surgery under general anesthesia. Saudi J Anaesth. 2018;12(2):272-278. doi: 10.4103/sja.SJA_543_17. PMID: 29628839; PMCID: PMC5875217.
13. Choi GS, Lee EH, Lim CS, Yoon SH. A comparative study on the usefulness of the Glidescope or Macintosh laryngoscope when intubating normal airways. Korean J Anesthesiol. 2011;60(5):339-43. doi: 10.4097/kjae.2011.60.5.339.
14. Tan BH, Liu EH, Lim RT, Liow LM, Goy RW. Ease of intubation with the GlideScope or Airway Scope by novice operators in simulated easy and difficult airways—a manikin study. Anaesthesia. 2009;64(2):187-90.
15. Russell T, Slinger P, Roscoe A, McRae K, Van Rensburg A. A randomised controlled trial comparing the GlideScope(®) and the Macintosh laryngoscope for double-lumen endobronchial intubation. Anaesthesia. 2013;68(12):1253-8. doi: 10.1111/anae.12322. PMID: 24219251.
16. Gunes M, Cinar AS, Uludag M. Randomized Prospective Comparison of Glidescope Video Laryngoscope with Macintosh Laryngoscope in Adult who Underwent Thyroid or Parathyroid Surgery Using Neuromonitorization. SisliEtfalHastan Tip Bul.2020;54(3):320-326. doi: 10.14744/SEMB.2020.06887. PMID: 33312030; PMCID: PMC7729713.
17. Patel, Jatin & Shah, Rajsi & Jain, Akshay & Shah, Arpit & Chauhan, Dinesh. (2022). comparative study between McCoy laryngoscope versus the tascope in orotracheal intubation in adult surgical patients undergoing general anaesthesia. International journal of health sciences. 2842-2854. 10.53730/ijhs.v6nS2.5717.