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# *Letters to the editor*

## Cardiovascular responses to tracheal intubation with the Airway Scope (Pentax-AWS)

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*To the editor:* The Pentax-AWS (in Japan, Airway Scope) video display unit, used in combination with a disposable blade (Pblade; AWS; Pentax, Tokyo, Japan) is a novel tracheal intubation device which allows indirect visualization of the vocal cords without the need to achieve a direct line of sight by conventional use of the "sniff" position and displacement of the tongue to the left and the hyoid bone anteriorly [1]. The intubation procedure with the AWS is monitored on a built-in liquid crystal display (LCD) monitor. The Pblade is anatomically designed to conform to the shape of the mouth and pharynx and to be passed over the dorsum of the tongue. Minimal displacement of the tongue and other soft tissues is necessary. The AWS may therefore be considered less invasive than the conventional Macintosh laryngoscope (McL; Penlon, Abingdon, UK). We compared cardiovascular changes following tracheal intubation with the AWS and the McL.

After obtaining institutional approval and written informed consent, 50 patients without hypertension scheduled for elective anesthesia were randomly assigned to group AWS or group McL. Induction of anesthesia was performed with fentanyl ($1\,\mu g \cdot kg^{-1}$) and propofol ($1.5–2.0\,mg \cdot kg^{-1}$) intravenously, followed by sevoflurane (5%). After complete paralysis was achieved with vecuronium ($0.1\,mg \cdot kg^{-1}$), tracheal intubation was performed. The time required to place the tube, and hemodynamic values (systolic blood pressure [SBP] and diastolic blood pressure [DBP] and heart rate [HR]) just before and 1, 2, 3, 4, and 5 min after intubation were measured. For statistical analysis, unpaired *t*-test and two-way analysis of variance (ANOVA) with repeated measures were used where appropriate, and $P < 0.05$ was considered significant. Patient profiles such as height and body weight were similar in both groups.

All intubations were successful at the first attempt and the time to place the tube was not different between the groups ($19 \pm 9$ s in AWS vs $18 \pm 8$ s in McL).

SBP, DBP, and HR after intubation were significantly increased in both groups, and there were no statistically significant differences in SBP, DBP, or HR between the groups (Fig. 1).

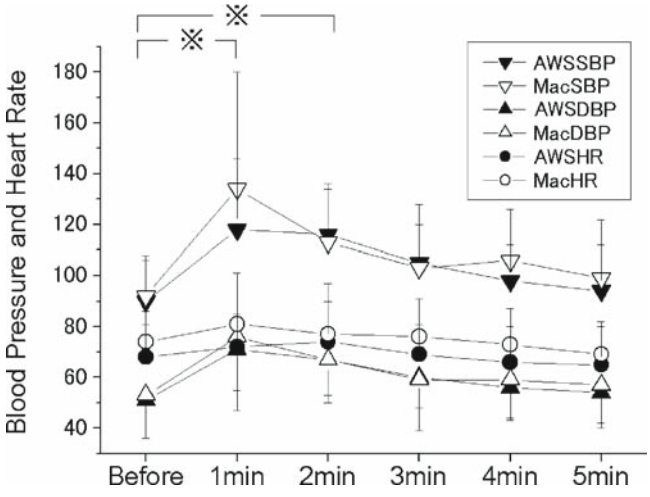


**Fig. 1.** Comparison of cardiovascular changes with two different laryngoscopes. Data values are presented as means ± SD. Systolic blood pressure (*SBP*), diastolic BP (*DBP*), and heart rate (*HR*) in both groups were significantly increased at 1 and 2 min after intubation compared to the baseline value. However, there were no significant differences between the values for the two laryngoscopes throughout the procedure. AWS, Pentax-AWS; *Mac*, Macintosh blade; *Before*, before intubation; *1, 2, 3, 4, 5 min*, after intubation. $^{※}P < 0.05$ compared to the baseline value

The recommended laryngoscopy technique with the AWS involves using the blade tip to elevate the epiglottis directly. This procedure is very similar to that used with the Bullard laryngoscope (BuLS; Gyrus ACMI, Southborough, MA, USA). Araki et al. [2] demonstrated that there were no significant differences in cardiovascular responses after intubation between the BuLS and the McL in 30 patients without airway problems. The Airtraq laryngoscope (ATQ; Prodol, Vizcaya, Spain) is another device similar to the AWS, but the view of the glottis can be optimized either by lifting the epiglottis directly, as with the AWS or BuLS, or indirectly by tensioning the hyoepiglottic ligament after the blade tip is positioned in the vallecula. Maharaj et al. [3] demonstrated that increases in HR were less when intubation was achieved with the ATQ than with the McL. Both the AWS and the ATQ provide a view of the glottis from behind the dorsum of the tongue, and therefore both devices probably require less lifting force than that required during direct laryngoscopy. It is unlikely that the technique of epiglottis elevation could cause this different result, (i.e., ATQ, but AWS attenuates cardiovascular responses), because the McL blade tip is al-

ways inserted into the vallecula and this technique is frequently used with the ATQ.

A previous study showed that the time to place the tube with the AWS was independent of the Cormack grade obtained with the McL; this finding implies that the AWS can solve most of the difficult intubations caused by difficult laryngoscopy with the McL, without prolonging the procedure [4].

Prolonged [5] or difficult [6] laryngoscopy is known to be associated with marked hypertension and tachycardia. Though the time to place the tube in our study is similar to those obtained previously [4], further study would be needed to determine whether the AWS reduces laryngoscopy time to attenuate the adverse cardiovascular response during intubation in patients in whom direct laryngoscopy is difficult (i.e., Cormack grade 3 or 4).

We conclude that there was no attenuation of hemodynamic responses to tracheal intubation with the AWS was observed in normotensive patients despite its anatomical shape and the laryngoscopy technique used.

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