



Comparison of hemodynamic effects of orotracheal intubation using McIntosh blade CMAC versus D blade CMAC Video-laryngoscope in hypertensive patients with normal airway A Randomized Controlled Trial



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INTRODUCTION/HYPOTHESIS

- Orotracheal intubation can cause significant hemodynamic responses, especially in hypertensive patients.
- C-MAC video-laryngoscopes, particularly the hyperangulated D-blade, may reduce laryngoscopic force and sympathetic stimulation compared to the standard Macintosh blade.
- This could help attenuate cardiovascular stress during intubation.
- Despite advancements, few studies have compared these blades in hypertensive patients.
- We hypothesized that the D-blade C-MAC would offer better hemodynamic stability, improving perioperative safety in this high-risk group.

Aim: To compare the blood pressure response to orotracheal intubation using McIntosh C-MAC versus D-blade C-MAC in hypertensive patients.

Design: Randomized controlled trial (N = 66).

Setting: Tertiary academic center, .

Participants: Sixty-six ASA II patients aged 18–65 years with controlled hypertension (BP $\leq 140/90$ mmHg on medication) requiring GA with endotracheal intubation were included.

Patients with ASA $\geq$ III, uncontrolled hypertension, cardiovascular disease, conduction abnormalities, or undergoing emergency surgery ,predicted difficult airway were excluded. Multiple attempts’ referred to more than one intubation attempt .

Randomization: randomized into Group M (Macintosh blade C-MAC) or Group D (Adult D-blade C-MAC) using computer-generated random numbers

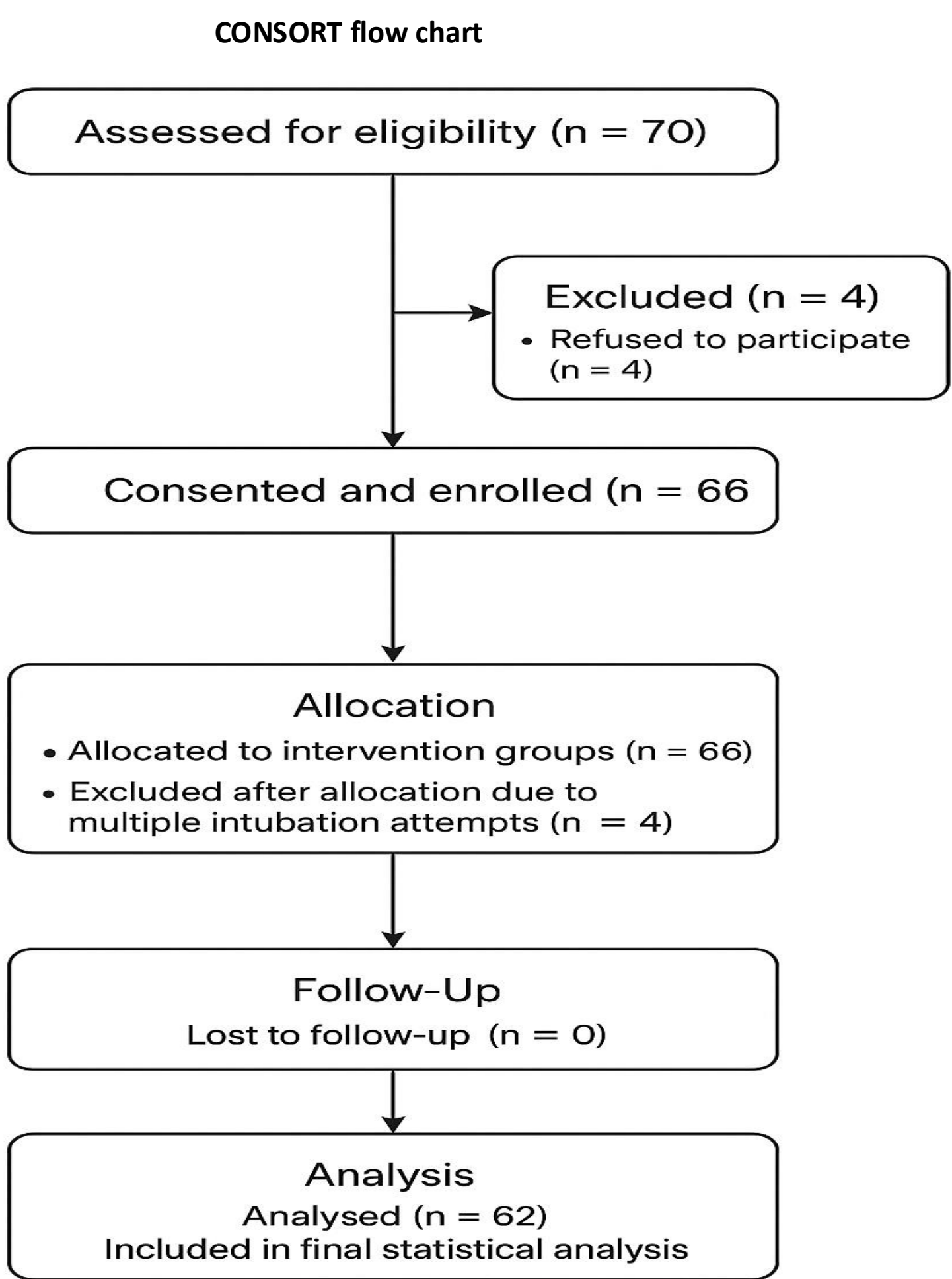
All intubations were performed by experienced consultant anaesthesiologists. Standard monitoring and anaesthesia induction was done in all patients .

Primary outcomes - changes in hemodynamic parameters at baseline, pre-intubation, and at 1, 3, and 5 minutes post-intubation.

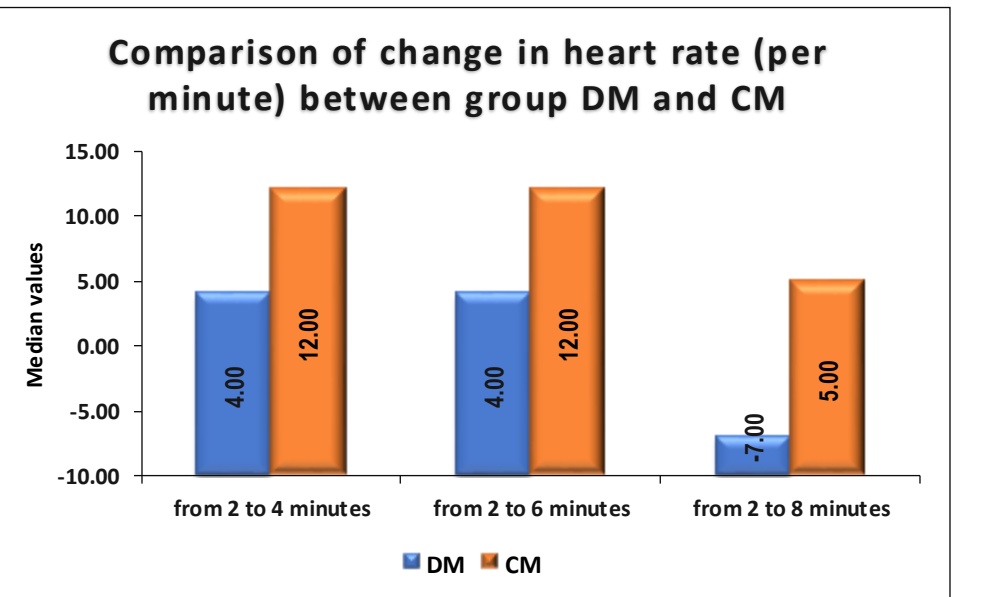
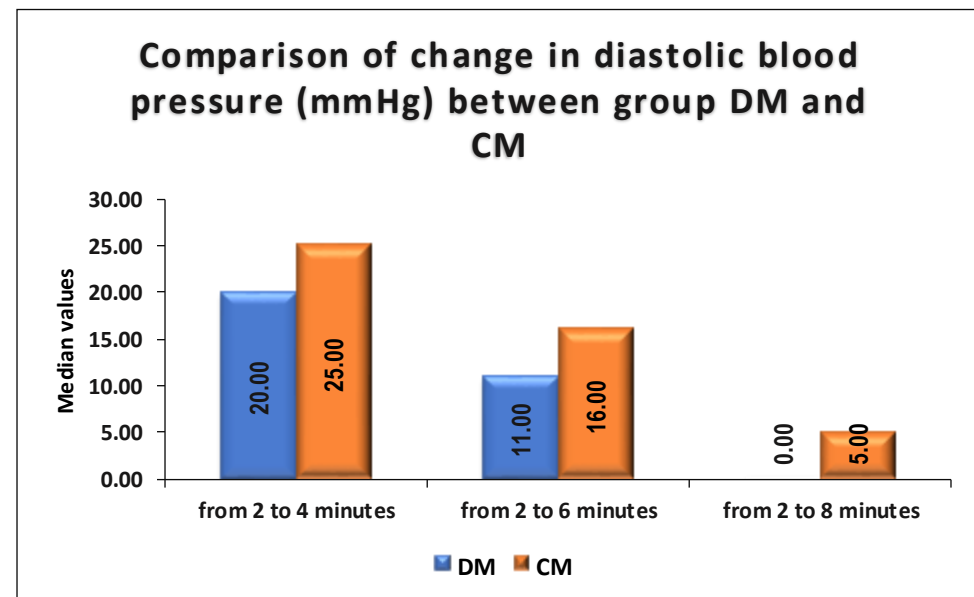
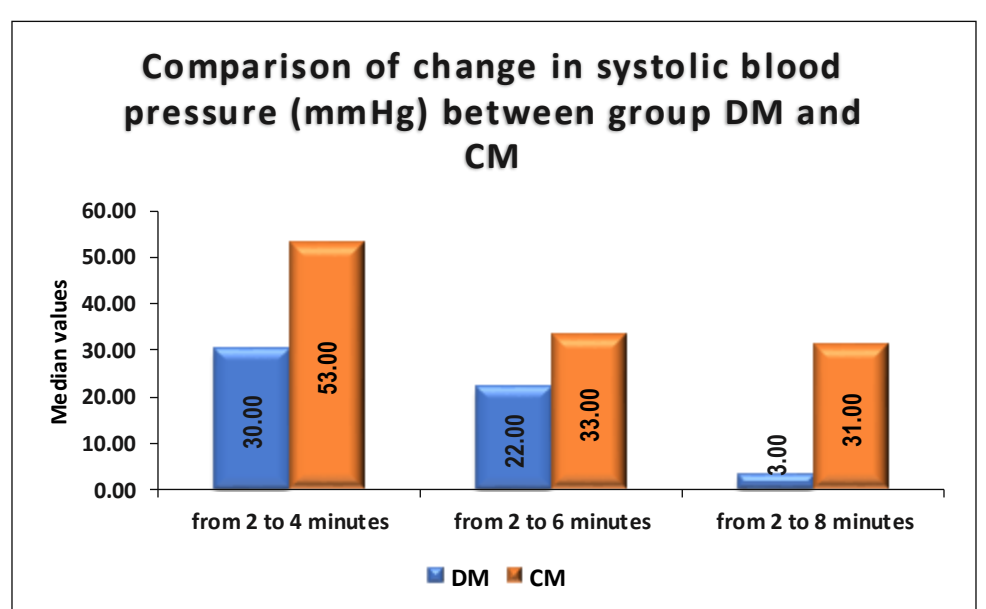
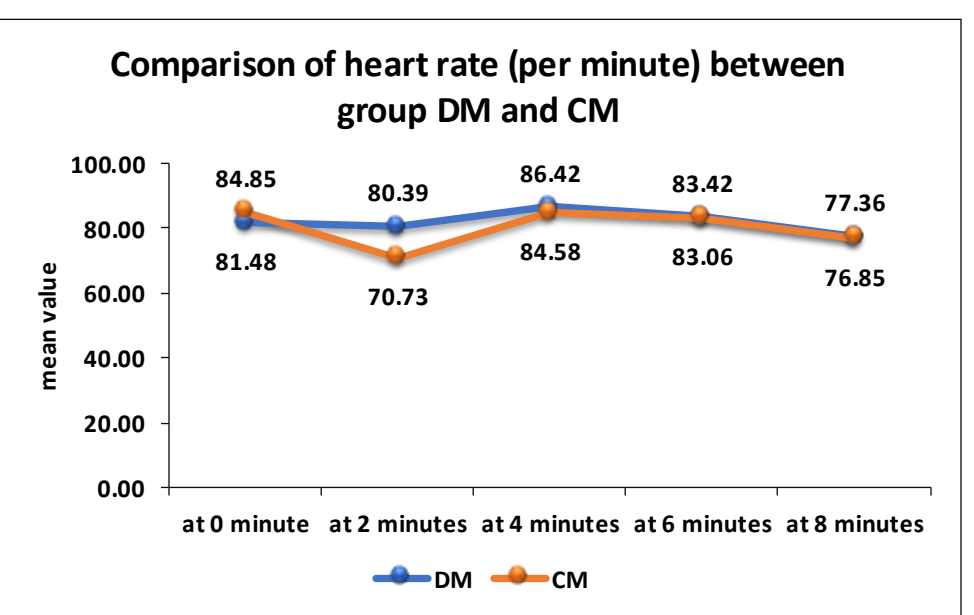
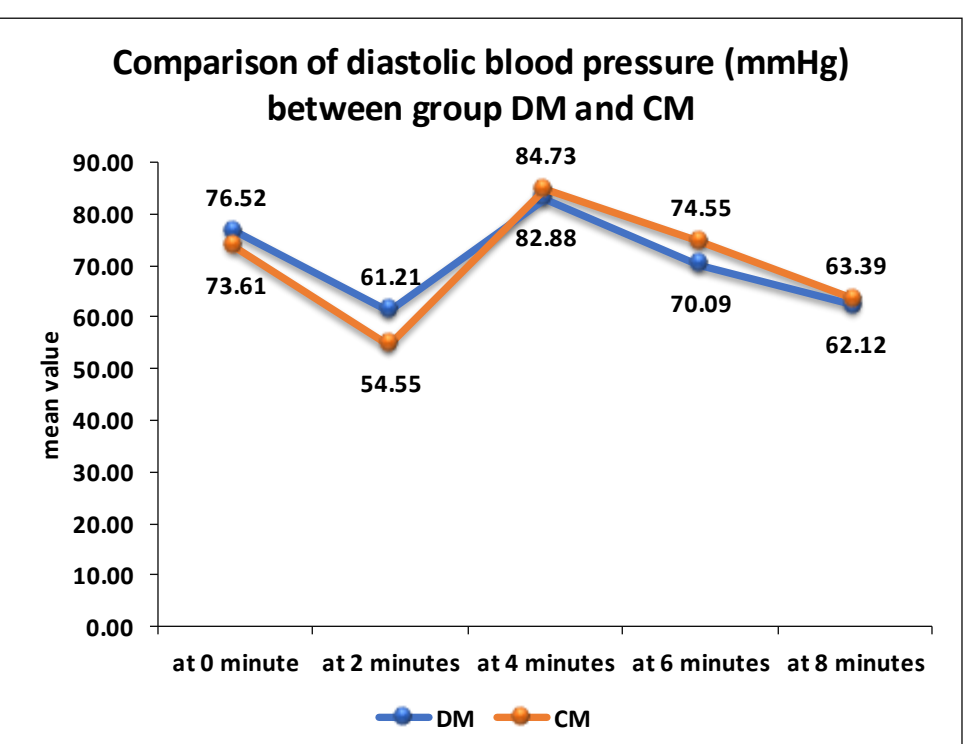
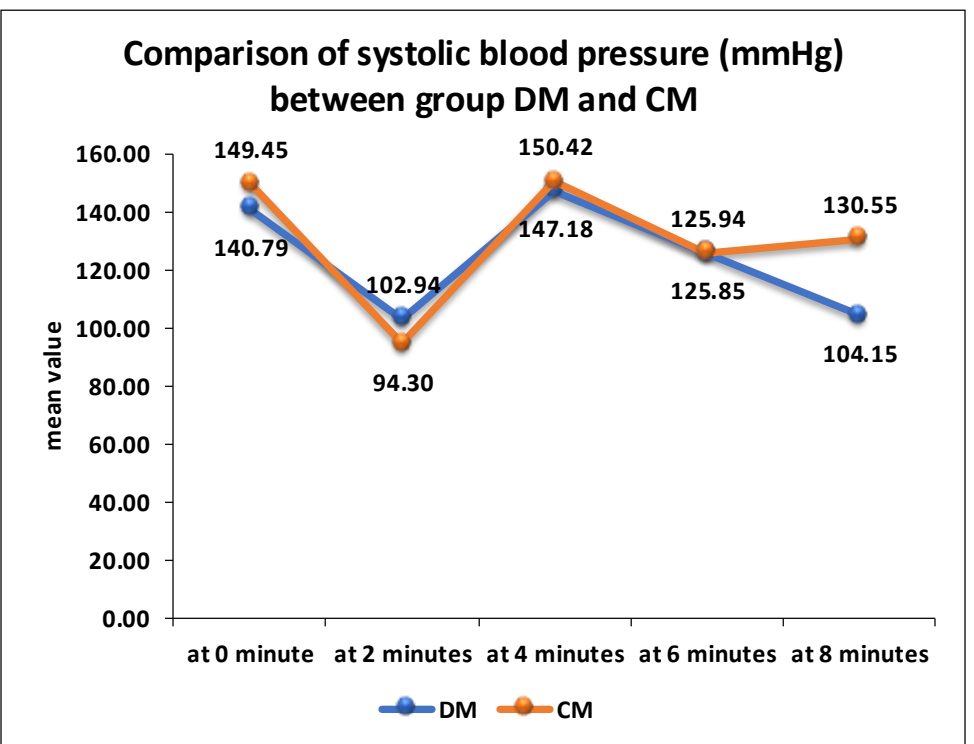
Secondary outcomes - intubation time, first-attempt success rate, POGO scoring, and adverse events.

RESULTS

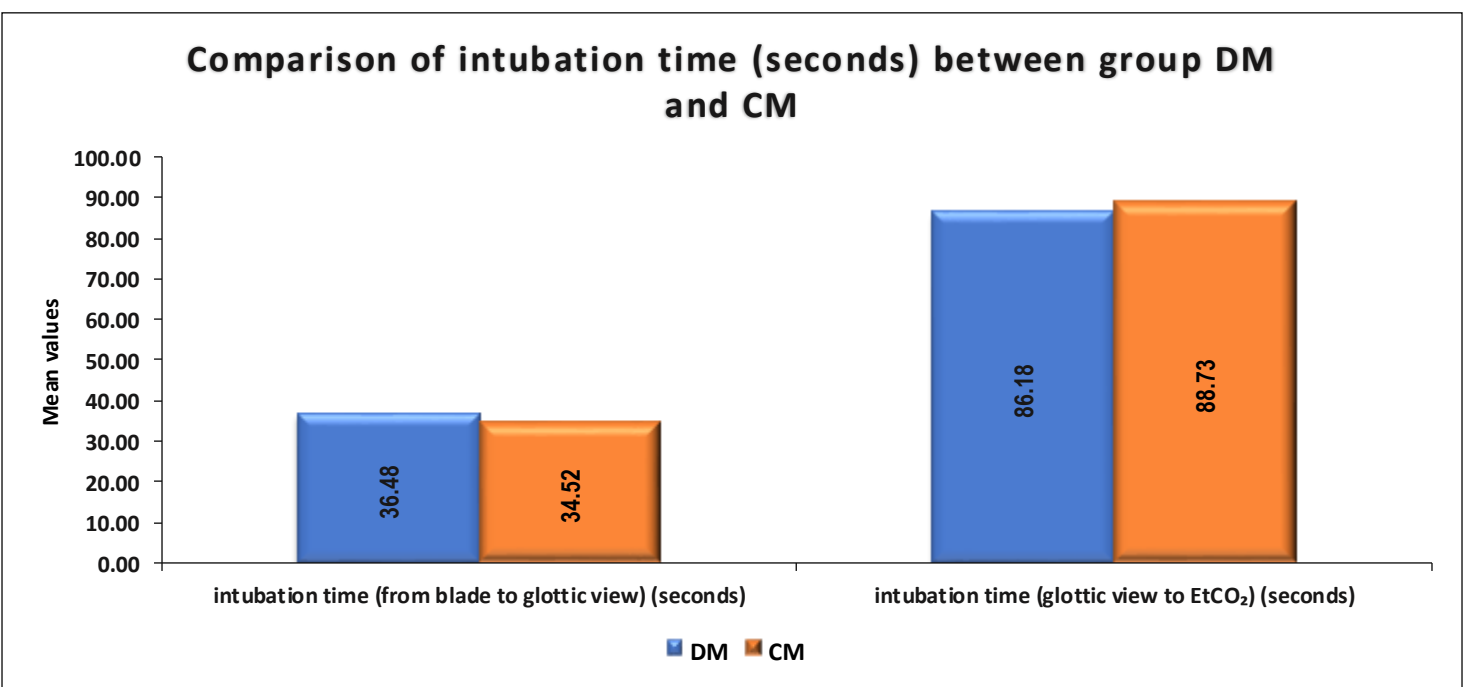
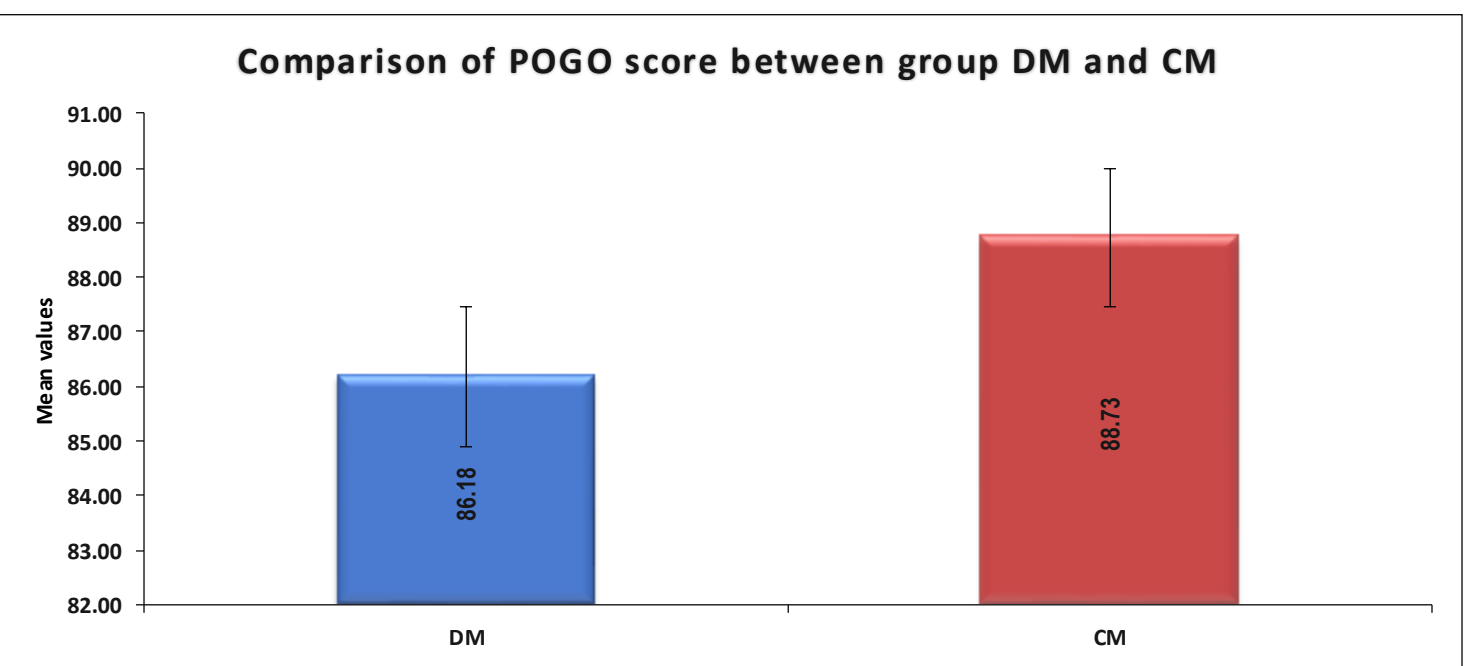
Sixty-two patients completed the study after excluding four patients requiring multiple intubation attempts. Demographics were comparable between groups. D-blade group demonstrated significantly lower systolic blood pressure changes at 2-4 minutes (30 vs 53 mmHg, $p=0.035$) and 2-8 minutes (3 vs 31 mmHg, $p<0.0001$). Diastolic blood pressure changes were significantly reduced in D-blade group at 2-4 minutes (20 vs 25 mmHg, $p=0.024$), 2-6 minutes (11 vs 16 mmHg, $p=0.003$), and 2-8 minutes (0 vs 5 mmHg, $p=0.022$). Heart rate changes were significantly lower in D-blade group at multiple time points. No significant differences were observed in intubation times between groups



Primary outcome



Secondary outcomes



DISCUSSION/ CONCLUSIONS

- Sarkilar et al. found similar hemodynamic responses with C-MAC and direct laryngoscopy in normotensive patients. In contrast, our study in hypertensives showed that the D-blade CMAC provided significantly better hemodynamic stability.
- Jain et al. compared D-blade and conventional C-MAC with direct laryngoscopes in a simulated cervical spine model and found the best glottic view with the D-blade, though hemodynamic responses were not assessed.
- Dabas et al. reported similar hemodynamic responses with D-blade and conventional C-MAC in simulated cervical spine scenarios in normotensive patients .
- This study uniquely demonstrates that the D-blade CMAC offers superior hemodynamic stability versus the conventional blade in hypertensives, addressing an important gap in current evidence.

CONCLUSION

The comparable intubation times indicate no compromise in procedural efficiency while achieving enhanced hemodynamic control, making D-blade an optimal tool for managing hypertensive patients undergoing general anaesthesia

Limitations

a small sample size and single center study. In future, larger multicentric trials are needed to validate the findings of our study.

CLINICAL IMPLICATIONS

Haemodynamic advantage of using a CMAC D blade as compared to conventional blade in specifically hypertensives. The hyperangulated design of D-blade likely requires reduced force application, resulting in attenuated sympathetic response and cardiovascular stimulation

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