15. Fares WH, Blanchard SK, Stouffer GA, *et al*. Thermodilution and Fick cardiac outputs differ: impact on pulmonary hypertension evaluation. *Can Respir J* 2012; **19**: 261–6

16. Murphy RM, Shah RV, Malhotra R, *et al*. Exercise oscillatory ventilation in systolic heart failure: an indicator of impaired hemodynamic response to exercise. *Circulation* 2011; **124**: 1442–51

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Effects of stellate ganglion block on cerebrovascular vasodilation in elderly patients and patients with subarachnoid haemorrhage

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Editor—In 1936, Leriche and Fontaine first drew attention to the fact that stellate ganglion block (SGB) caused a 'striking regression of symptoms in two cases of postoperative hemiplegia'.[1] Since then, numerous studies have emphasized the usefulness of SGB to reduce the vascular spasm associated with cerebral thrombosis and embolism.[1] Stellate ganglion block causes sympathetic inhibition of the ispilateral head, neck, upper thorax, and arms, resulting in peripheral vasodilation.[2] However, its effects on cerebral haemodynamics, in ageing, or in subarachnoid haemorrhage (SAH) are not clear. This study demonstrates, for the first time, the importance of SGB to clarify age-related or SAH-related differences in vasospasm and the efficacy of SGB in relation to the responses of basilar arteries.

Age is a major risk factor for a poor outcome in patients with cerebral vascular disease, including SAH.[3 4] Recent studies have shown that the incidence of SAH in the elderly, especially those older than 60 yr of age, is increasing with the increased age of the general population.[3 4] In the aged brain, there is a reduction in the angiogenesis response because of decreased responsiveness to hypoxia-inducible factor 1.[5 6] Although the biological and medical consequences of a stroke are significant at any age, the incidence and severity of a stroke is significantly increased with age. Gupta and colleagues[7] and Jain and colleagues[8] found that SGB decreases cerebral vascular tone without affecting the capacity of cerebral blood vessels to react to the changes in carbon dioxide or to autoregulate. Stellate ganglion block might have a

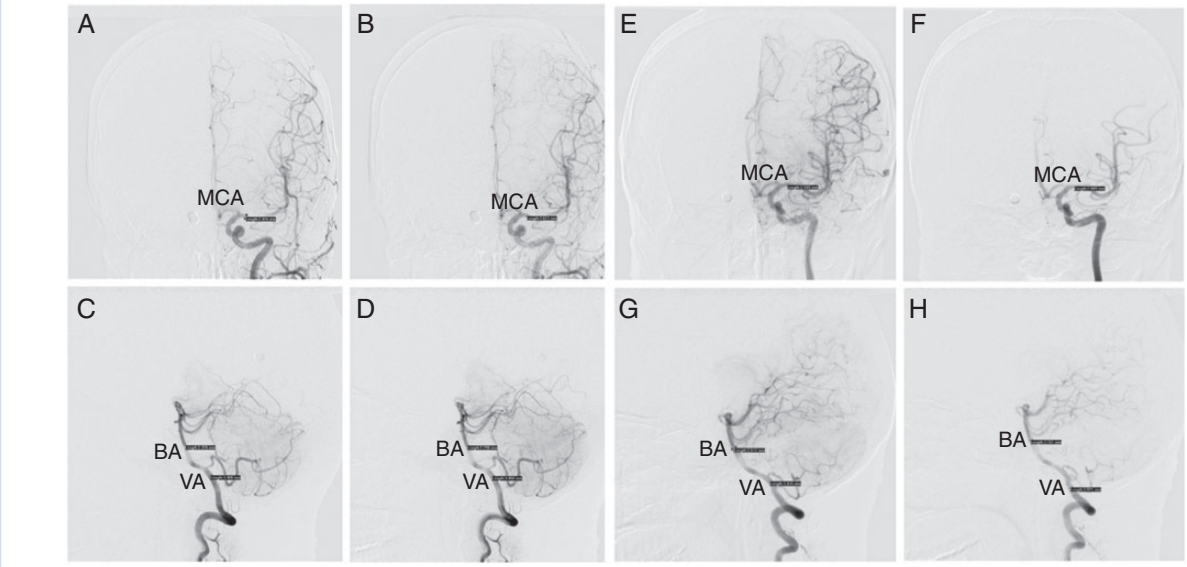

Fig 1 Representative sagittal views showing measurement of the calibre of the middle cerebral artery (MCA), vertebral artery (VA), and arteriae basilaris (BA) in an elderly patient and in a patient with subarachnoid haemorrhage on digital subtraction angiography. (A–D) A male patient aged 75 yr suffered from an intracranial aneurysm. After stellate ganglion block (SGB), the calibre of the MCA increased from 3.386 (A) to 3.804 mm (B), the calibre of the VA increased from 3.328 (C) to 3.855 mm (D), and the calibre of the BA increased from 2.891 (C) to 3.121 mm (D). (E–H) A male patient aged 56 yr suffered from an aneurysm of arteriae cerebri media M2 temporal region with subarachnoid haemorrhage. After SGB, the calibre of the MCA increased from 2.589 (E) to 2.809 mm (F), the calibre of the VA increased from 3.476 (G) to 3.921 mm (H), and the calibre of the BA increased from 2.612 (G) to 3.161 mm (H).

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therapeutic role in patients where cerebral insufficiency can be attributed to cerebral vasospasm.

In the present study, after SGB a significant increase in the calibre of middle cerebral artery (MCA), vertebral artery (VA), and arteriae basilaris (BA) in adult patients and elderly patients was observed (Fig. 1). The increase in calibre of the MCA, VA, and BA in adult patients was higher than that in elderly patients. We also found that the calibre of the MCA, VA, and BA was increased in patients with or without SAH after treatment with SGB (Fig. 1). Interestingly, the increase in blood vessel calibre was larger in patients with SAH compared with patients without SAH. Importantly, SGB did not induce bleeding but reduced cerebral vasospasm.

Taken together, these studies suggest the possibility that SGB might have potential use in the treatment or control of cerebral vascular accidents in both elderly patients and patients with SAH and might promisingly be applied clinically after further research. Further studies are needed to determine cerebral vascular changes through prolonged observation or by repeating the block in elderly patients and patients with SAH.

Declaration of interest

None declared.

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References

1. Moore DC. Stellate ganglion block—therapy for cerebral vascular accidents. *Br J Anaesth* 2006; **96**: 666; author reply 666–667
2. Hey M, Wilson I, Johnson MI. Stellate ganglion blockade (SGB) for refractory index finger pain – a case report. *Ann Phys Rehabil Med* 2011; **54**: 181–8
3. Lanzino G, Kassell NF, Germanson TP, *et al*. Age and outcome after aneurysmal subarachnoid hemorrhage: why do older patients fare worse? *J Neurosurg* 1996; **85**: 410–8
4. Pahl FH, Oliveira MF, Rotta JM. Natural course of subarachnoid hemorrhage is worse in elderly patients. *Arq Neuropsiquiatr* 2014; **72**: 862–6
5. Ingraham JP, Forbes ME, Riddle DR, Sonntag WE. Aging reduces hypoxia-induced microvascular growth in the rodent hippocampus. *J Gerontol A Biol Sci Med Sci* 2008; **63**: 12–20
6. Petcu EB, Smith RA, Miroiu RI, Opris MM. Angiogenesis in old-aged subjects after ischemic stroke: a cautionary note for investigators. *J Angiogenes Res* 2010; **2**: 26
7. Gupta MM, Bithal PK, Dash HH, Chaturvedi A, Mahajan RP. Effects of stellate ganglion block on cerebral haemodynamics as assessed by transcranial Doppler ultrasonography. *Br J Anaesth* 2005; **95**: 669–73
8. Jain V, Rath GP, Dash HH, Bithal PK, Chouhan RS, Suri A. Stellate ganglion block for treatment of cerebral vasospasm in patients with aneurysmal subarachnoid hemorrhage – a preliminary study. *J Anaesthesiol Clin Pharmacol* 2011; **27**: 516–21

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Comparison of high and low pillow heights for tracheal tube intubation with the Pentax-AWS Airwayscope®: a prospective randomized clinical trial

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Editor—The appropriate pillow height for tracheal intubation with the Pentax-AWS Airwayscope® (AWS) has not been assessed.[1] This randomized clinical trial aimed to compare pillow height for tracheal intubation with the AWS in patients undergoing elective surgery. The primary outcome was time to intubation.

The Research Ethics Committee of Osaka Medical College approved the study protocol. This study is listed in the UMIN Clinical Trials Registry under registration number UMIN000018208. Tracheal intubation with the AWS was performed with a high pillow (HP group, 12 cm pillow height, 40 patients) or low pillow (LP group, 4 cm pillow height, 40 patients). Anaesthesia was induced with propofol and remifentanil.[2] Intubation time, the primary outcome measure, was assessed using the Mann–Whitney *U*-test to compare between groups. For interest, we also applied the following hypothesis tests to compare the secondary outcome measures: the Mann–Whitney *U*-test for the number of attempts required for insertion of the Intlock blade, the percentage of glottis opening (POGO) score, the number of attempts required for tracheal intubation, and visual analog scale (VAS); χ^2 test for Cormack–Lehane classification; and Fisher's exact test for the incidence of hoarseness and pharyngeal pain. Data are presented as mean (SD). A value of $P<0.05$ was considered statistically significant. We performed a preliminary study, in which 16 patients underwent tracheal intubation using the AWS with either an HP or an LP ($n=8$ in each group). Intubation time was 29.2 (9.2) s with an LP and 41.2 (10.7) s with an HP. To detect this difference with 80% power at a 5% significance level, 34 patients were required for each group. Therefore, we planned to recruit 40 patients for each group to adjust for missing data.

Patient characteristics including age, sex, body weight, height, BMI, duration of surgery, duration of anaesthesia, Mallampati score, and tracheal tube size were similar. No patient was abandoned or lost to follow-up during this trial. The results are shown