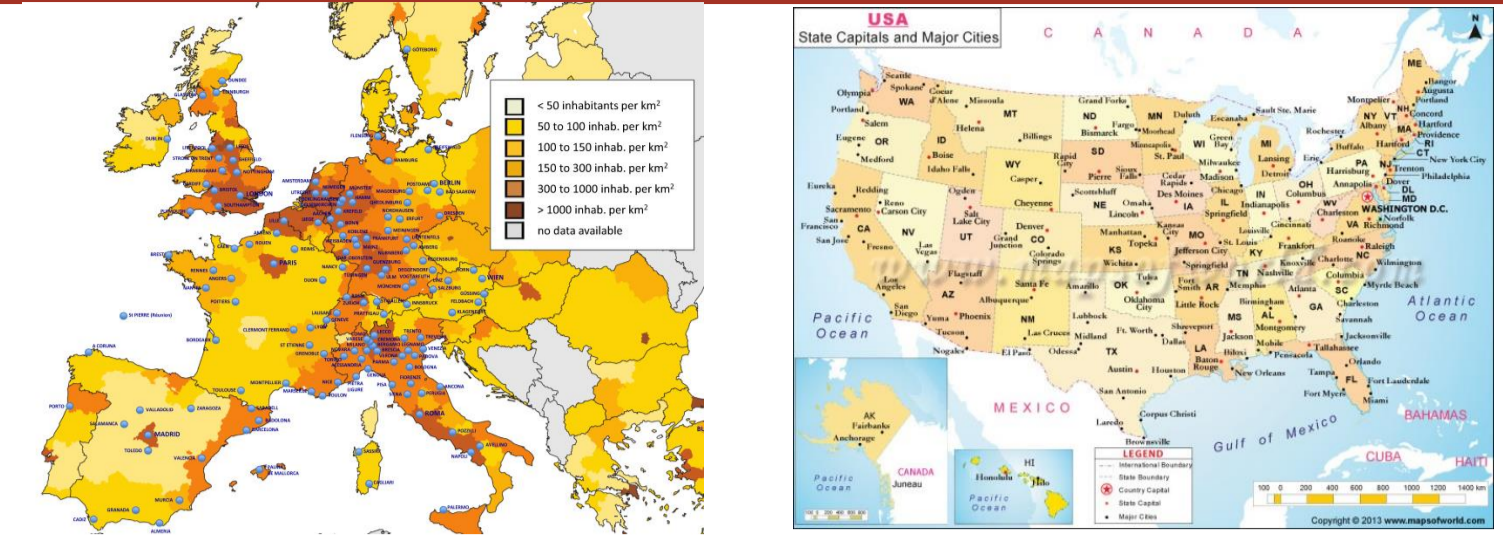


Perioperative management of aneurysmal subarachnoid hemorrhage: European and American survey results

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Background & Goal of study

Many aspects of aneurysmal subarachnoid hemorrhage (SAH) vasospasm therapy remain controversial. The European Neuroanaesthesia and Critical Care Interest Group (ENIG group) conducted a survey to determine the clinical practices of physicians treating SAH, and to evaluate the discrepancy between practice and published evidence¹⁻³.

Materials & Methods

The research team generated a 31-item online questionnaire, which was distributed by the ENIG Group. Nine questions focused on vasospasm prevention, diagnosis and treatment. The survey remained online from early October to the end of November 2012 in Europe and from January 6th until February 7th 2014 through the SNACC web for its members. Fisher's exact test was used for the analysis of responder subgroups.

Results & Discussion

Some respondents skipped answers and some questions have more than one possible response

	ENIG Survey (n=268)	SNACC Survey (n=77)	P value
Age (years) - n (%)			
<35	36 (13.4)	5 (6.6)	0.16
36-50	146 (54.4)	34 (44.7)	0.43
51-65	86 (32.1)	34 (44.7)	0.17
>65	0 (0.0)	4 (5.3)	<0.05
Primary Specialty - n (%)			
Mainly Neurological Critical Care	68 (25.4%)	2 (2.6)	<0.05
Mainly Neuroanesthesia	80 (29.9)	55 (72.4)	<0.05
Both	120 (44.8)	19 (25.0)	<0.05
Number of craniotomy per year - n (%)			
> 1000	21 (16.4)	26 (34.2)	<0.05
500-999	25 (33.6)	35 (46.1)	<0.05
< 500	33 (50.0)	15 (19.7)	0.21

	ENIG Survey (n=268)	SNACC Survey (n=77)	P value
Criteria for ICU admission after SAH - n (%)			
All patients after SAH	193 (72.0)	69 (89.6)	0.25
Only high grade patients (WFNS 3-5)	75 (28.0)	8 (10.4)	<0.05
Aneurysm repair			
Delay to treat aneurysm - n (%)			
As soon as possible even at night	101 (37.7)	30 (34.5)	0.90
< 24h after admission	118 (44.0)	36 (47.4)	0.81
< 48 h after admission	40 (14.9)	7 (9.2)	0.34
< 72 h after admission or later	9 (3.4)	4 (5.3)	0.49
Procedure to treat the aneurysm - n (%)			
>60% coiling	86 (32.1)	33 (43.4)	0.21
>90% coiling	90 (33.6)	12 (15.8)	0.23
>60% clipping	28 (10.4)	28 (36.8)	<0.05
>90% coiling	20 (7.5)	2 (2.6)	0.18
Same proportion	44 (16.4)	0 (0.0)	<0.05

	ENIG Survey (n=268)	SNACC Survey (n=77)	P value
Prophylactic anti-epileptic treatment - n(%)			
Systematic	54 (20%)	39 (52.7%)	<0.05
Only in patients with a history of seizures	136 (51%)	23 (31%)	<0.05
No prophylactic treatment	78 (29%)	12 (16.2%)	<0.05

	ENIG Survey (n=268)	SNACC Survey (n=77)	P value
Anesthetic technique for coiling			
Written anesthetic protocol - n (%)			
Yes	96 (35.8)	21 (27.6)	0.36
No	172 (64.2)	55 (72.4)	0.61
Hypnotic mainly used - n (%)			
Total intravenous anesthesia	195 (72.8)	24 (33.3)	<0.05
Inhalation anesthesia	73 (27.2)	48 (66.7)	<0.05
Narcotic mainly used - n (%)			
Remifentanyl	184 (68.7)	30 (41.7)	<0.05
Sufentanyl	50 (18.6)	3 (4.2)	<0.05
Fentanyl	32 (11.9)	45 (62.5)	<0.05
None	2 (0.8)	0 (0.0)	1.00
Management of blood pressure - n (%)			
Noradrenaline (Norepinephrine)	140 (52.2)	6 (8.1)	<0.05
Ephedrine	52 (19.4)	2 (2.7)	<0.05
Phenylephrine	30 (11.2)	59 (79.7)	<0.05
Dopamine	11 (4.1)	1 (1.4)	0.47
Metaraminol	14 (5.2)	0 (0.0)	0.05
Decrease the depth of anaesthesia	14 (5.2)	9 (12.2)	0.06
Others	7 (2.6)	3 (4.1)	0.46
Neuroprotective strategy during temporary clipping - n (%)			
Drug-induced burst suppression	98 (36.6)	44 (57.9)	<0.05
Hypothermia	10 (3.7)	5 (6.6)	0.34
Nor or exceptional	160 (59.7)	34 (44.7)	0.22
Others	0 (0.0)	2 (2.6)	0.05

	ENIG Survey (n=268)	SNACC Survey (n=77)	P value
Anesthetic technique for clipping			
Written anesthetic protocol - n(%)			
Yes	112 (41.8)	27 (35.5)	0.54
No	156 (58.2)	49 (64.5)	0.67
Hypnotic mainly used - n(%)			
Total intravenous anesthesia	207 (72.2)	34 (47.2)	<0.05
Inhalation anesthesia	61 (22.8)	40 (55.6)	<0.05
Narcotic mainly used - n(%)			
Remifentanyl	191 (71.3)	47 (63.51)	0.60
Sufentanyl	52 (19.4)	9 (12.2)	0.30
Fentanyl	25 (9.3)	29 (39.2)	<0.05
None	0 (0.0)	1 (1.4)	1
Management of blood pressure - n (%)			
Noradrenaline (Norepinephrine)	151 (56.3)	9 (11.8)	<0.05
Ephedrine	46 (17.2)	2 (2.6)	<0.05
Phenylephrine	31 (11.6)	59 (77.6)	<0.05
Dopamine	12 (4.5)	2 (2.6)	0.75
Metaraminol	11 (4.1)	0 (0.0)	0.12
Decrease the depth of anaesthesia	10 (3.7)	8 (10.5)	<0.05
Others	7 (2.6)	3 (4.0)	0.69
Blood pressure target during temporary clipping - n(%)			
No specific target	29 (11%)	14 (18.7%)	0.07
Mean arterial pressure 60-70 mmHg	59 (22%)	6 (8%)	<0.05
Mean arterial pressure 71-80 mmHg	83 (31%)	16 (21.3%)	0.11
Mean arterial pressure 81-90 mmHg	78 (29%)	22 (29.3%)	1
Mean arterial pressure > 90 mmHg	19 (7%)	17 (22.7%)	<0.05
Recovery and tracheal extubation after uncomplicated surgery - n(%)			
As soon as possible in most patients	217 (81.0)	73 (94.8)	0.40
After a 1-3 hours delays in the PACU	17 (6.3)	1 (1.3)	0.13
Delayed in the ICU in most patients	34 (12.7)	3 (3.9)	0.05

Conclusion

This study found striking variability in practice patterns of European and United States physicians involved in SAH. These heterogeneous practices are frequently at variance with available guidelines on SAH management.

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