TITLE: IMPACT ON CSF PRESSURE IN BRAIN TUMOR PATIENTS: ISOFLURANE VS N_2O

AUTHOR: R JUNG, R REINSEL, J GALICICH, R BEDFORD
AFFILIATION: MEMORIAL SLOAN-KETTERING & CORNELL MEDICAL COLLEGE, NYC

Both N_2O and isoflurane (ISO) can cause increases in cerebrospinal fluid pressure (CSFP).[1,2] This study utilizes a crossover protocol to identify which agent is less likely to increase CSFP when intracranial compliance is compromised.

Subjects were 20 informed, consenting patients undergoing excision of supratentorial tumors. The protocol was IRB-approved. Radial arterial and lumbar spinal catheters were placed to monitor BP and CSFP. Anesthesia was induced with a thiopental-vecuronium technique. Patients were randomized to 1 of 2 anesthetic sequences: Group 1) ISO, 0.7% end-tidal (ET) in O_2, which was changed to 70% N_2O in O_2; Group 2) 70% N_2O in O_2, which was changed to 0.7% ET ISO in O_2. $PETCO_2$ was maintained at 30-35 mmHg. %ET N_2O, %ET ISO and $PACO_2$ were recorded just prior to changing anesthetics (T=0 min) and at the end of a 20 min observation period (T=20 min). Data were analyzed using Student's t-test for paired data and repeated measures ANOVA, as appropriate. Critical significance was $P<.05$.

CSFP increased 33% in group 1, despite a slight decrease in $PACO_2$ (Table). CSFP values in group 1 were different from group 2 starting 5 min after T=)); Group*Time: $F_{(4,72)} = 4.33$, $P<.004$.

We conclude that ISO is preferable to N_2O as an inhalational anesthetic when intracranial compliance is compromised.

REFERENCES: 1) Henriksen HT et al. Br J of Anaesth.45:485-496. 2) Grosslight K, et al. Anesthesiology 63:533-536,1985.

	GROUP 1 ISOFLURANE TO N_2O		GROUP 2 N_2O TO ISOFLURANE	
PARAMETER	0 MIN	20 MIN	0 MIN	20 MIN
CSFP (mmHg)	9.1 ±1.2	12.3* ±2.2	9.5 ±1.1	9.1 ±1.4
MAP (mmHg)	87.6 ±4.9	89.9 ±3.9	94.2 ±5.7	87.2 ±4.0
HR (bpm)	74.7 ±5.0	70.4 ±4.6	75.6 ±3.3	71.8 ±3.3
$PaCO_2$ (mmHg)	37.0 ±1.4	34.2* ±0.9	35.1 ±0.9	36.3 ±1.3
%ET ISOFLURANE	0.68 ±0.01	0	0	0.71 ±0.01
%ET N_2O	0	65.6 ±1.1	67.8 ±0.5	0

ALL VALUES=MEAN±S.E.; *P<0.05 vs T=O

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TITLE: PROPOFOL AND SPONTANEOUS MOVEMENTS: AN EEG STUDY

AUTHORS: A. Borgeat M.D., C. Dessibourg, M.D., V.Popovic M.D., D. Schwander, M.D.

AFFILIATION: Service d'anestésiologie-réanimation et centre EEG-EMG, Hôpital Cantonal de Fribourg, 1700 FRIBOURG 8, SWITZERLAND

Propofol (P) is the newest intravenous agent for induction and maintenance of anesthesia. Spontaneous movements (SP) are a common side-effect observed during induction. Some authors have reported epileptic activity associated with P (1), but others have not been able to demonstrate any proconvulsive activity (2). In view of the controversy surrounding the association between P and seizures, we recorded electroencephalographic (EEG) tracings of healthy children during induction of anesthesia with P.

Twenty-one children, ASA I, aged 6 to 12, were randomly assigned to group A (P 3 mg kg^{-1} as a loading dose), B (P 5 mg kg^{-1} as a loading dose) or C (thiopentone 5-7 mg kg^{-1}). Baseline EEG were recorded during 10 min and then from the beginning of induction until five min after endotracheal intubation.

SP were observed in all children in group A but only in 14% in groups B and C. EEG tracings were comparable in the 3 groups. Following a mean latency of 12 seconds after the administration of P, the tracing showed acceleration from 9-10 cycles per second (alpha waves) to more than 14 cycles per second (beta waves) during two seconds. Then slow, large waves of 2-3 cycles per second (delta waves) appeared for 1 to 2 minutes. Finally, reappearance of fast beta waves mixed with large delta waves which were progressively but incompletely replaced by the beta waves. A discrete but insignificant tendancy to show more delta waves in group B was noted. Neither spikes, spike-wave patterns, rhythmic theta waves nor burst suppressions were observed. SM were dystonic in nature and appeared exclusively during the early delta waves phase.

In conclusion, this study showed that SM observed during induction with P are not related to any form of epilepsy. These movements are dystonic in nature and suggest subcortical structures involvement. Compared to 3 mg kg^{-1} a loading dose of 5 mg kg^{-1} of P in children is safe, hemodynamically well tolerated and the incidence of SM is significantly decreased.

References

1. Lancet 2: 1518, 1987.
2. European J. of Anaesthesiology 3: 159-166, 1986.
