TITLE: ANESTHETIC ALTERATIONS OF THE NEUROGENIC MOTOR EVOKED POTENTIALS IN SWINE

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Neurogenic motor evoked potentials (NMEP) are described as a method of monitoring the integrity of the anterior spinal cord during surgery. The sensitivity and specificity of NMEPs in detecting motor tract dysfunction during spinal surgery has been shown in both animals and humans. Isolated reports suggest that the NMEP may be resistant to alterations in latency and amplitude with commonly used inhalational and intravenous anesthetic agents. This study describes alterations in latency and amplitude of NMEPs with the use of the common inhalational agents.

After approval by the Clinical Investigation Animal Use Committee, NMEPs were obtained in 14 swine anesthetized with halothane (n=5), enflurane (n=4), or isoflurane (n=5). After inhalational induction, baseline NMEPs were obtained at a low concentration of each volatile agent (0.2%). Nitrous oxide was then administered in concentrations of 50% and 70% and NMEPs were generated. The N_2O was discontinued and each potent agent was studied at .25 MAC increments up to 1 MAC. $PaCO_2$ was kept at 40mmHg and MAP was maintained at 80-100mmHg by dopamine infusion, as needed. Temperature was maintained at 36 - 37°C.

There was no significant effect on latency with any of the agents studied. There was a predictable decrease in amplitude at each 1/4 MAC increase in potent inhalation agents, ($p<.01$) with a 50% reduction in amplitude at 1/2 MAC of each agent. NMEPs were ablated at 1 MAC for all potent agents except for two swine in the enflurane group. When N_2O was added to a low concentration of volatile agents, there was a significant ($p<.05$) decrement in amplitude at both 50% and 70%.

Base on this study, we conclude that the commonly used inhalational agents cause minimal prolongation in the latency of NMEPs. There was, however, a profound effect on the amplitude. These findings suggest that anesthetic techniques should be limited to low concentrations of potent inhalational agents, or by excluding the use of N_2O in combination with potent agents. Also, the concentration of the anesthetic should be held constant to avoid misinterpretation of intraoperative changes in NMEPs.

Effect of Volatile Agents on NMEP

	AMP (u volt)[a]				
Agent	Baseline	1/4 MAC	1/2 MAC	3/4 MAC	1 MAC
HAL	5.8±1.6*	4.7±1.5+	1.4±.12++	.49±.11++	NM
N	5	5	5	5	0
ETH	3.7±.46*	1.8±.32+	.93±.12++	.62±.12++	.17±.09++
N	4	4	4	4	2
ISO	3.5±.81*	3.0±.77+	1.4±.23++	.54±.13++	NM
N	5	5	5	5	0

a values expressed as mean ± SEM * control
\+ $p<.01$, ++ $p<.005$ - two tailed paired Student's t-test
NM not measurable

Effect of N_2O Concentration on NMEP

	Amplitude (u volt)[a]	
Baseline	4.4 ± .72*	n = 14
50%	2.3 ± .32+	n = 14
70%	1.6 ± .43++	n = 14

a values expressed as mean ± SEM * control
\+ $p<.05$, ++ $p<.005$ - two tailed paired Student's t- test

A210

TITLE: APPRAISAL OF THE QUALITY OF ASSESSMENT OF MEMORY IN ANESTHESIA AND PSYCHOPHARMACOLOGY LITERATURE

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We hypothesized that there are important differences between studies on memory published in anesthesia (A) and psychopharmacology (P) literature (lit) although both deal with effects of drugs on memory. All articles in the English language journals which contained the words anesthesia or anesthesiology and psychopharmacology in their titles were searched. Articles which were indexed under the key words "human" and "learning", "memory disorders", "cognition" or "cognition disorders" were retrieved from Medline, the National Library of Medicine's bibliographic data base, from 1978 through May 1988. The same number of articles each year was randomly chosen from among the psychopharmacology journals to match the number in anesthesia journals. Each article was reviewed independently by two investigators who identified and recorded 29 items (see below). Statistical analyses were performed using the Wilcoxon Rank Sum tests, Mantel-Haenszel relative rate statistics and Fischer's Exact tests.

Results: Eighty eight articles in each discipline were reviewed. The sample sizes were larger for the A lit than the P lit (medians of 52.5 vs. 18). Most of the studies in the A lit used patients (85%) with a median age of 38.9 years and a median of 28 women. On the other hand more of the studies in the P lit used healthy volunteers (60%) with a median age of 23.6 years and only a median of 3.5 females. These characteristics were more common in the P than the A lit: use of a control or placebo group (90% vs. 42%); double blind design (80% vs. 47%); use of pre and post-treatment memory measurements (64% vs. 23%); use of multiple memory tests with distinct equated stimuli (83% vs. 8%); methodology was related to some theoretical model of memory (72% vs. 17%); other behavioral tests were used (68% vs. 48%) and conclusions were justified (84% vs. 25%). Relative to the P lit, the A lit used pictures as stimuli for the memory tests more often (44% vs. 14%) and words less often (11% vs. 67%). The A relative to the P lit relied heavily on questions about recall of perioperative events (41% vs. 0%). All ps were < .05 - .001.

Discussion: Authors publishing in A lit should use more placebo controls, double blind procedures and pretreatment measurements in the design of their experiments. Studies should be based on a theoretical model of memory. If pictorial materials are used, they should be appropriately equated. Recall of events on the day of operation is not by itself an adequate assessment of memory Investigators publishing in P lit should do more studies in patients, and use larger samples, which include women.