

Title: RECTAL METHOHEXITAL IN CHILDREN UNDERGOING COMPUTERIZED CRANIAL TOMOGRAPHY AND MAGNETIC RESONANCE IMAGING SCANS

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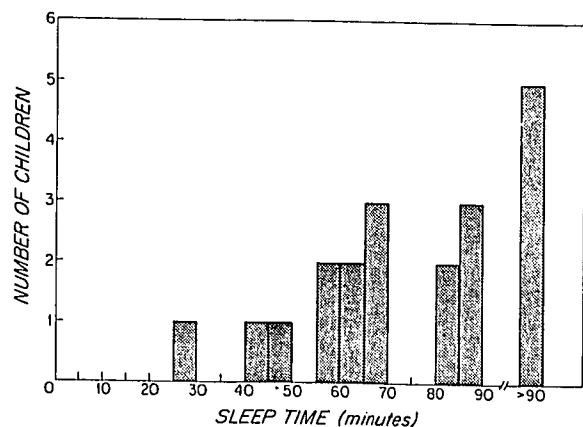
Introduction: Previous reports on rectally administered methohexital describe the effectiveness of the drug, the time from drug administration to the onset of sleep, and the recovery room discharge time of patients. The duration of sleep in children who are given only rectal methohexital and no other anesthetic drugs has not been investigated. The present study was undertaken to evaluate the effect of rectal methohexital (30 mg/kg) as the sole drug in children for computerized cranial tomography (CT) and magnetic resonance imaging (MRI) scans and to determine the duration of sleep in children after this dose.

Methods: Forty ASA Class I and II children for outpatient CT and MRI scans were studied after obtaining institutionally approved informed parental consent. Patients ranged in age from 10 weeks to 7.4 years (mean \pm SD = 2.6 ± 1.7 years) and weighed between 6.0 and 30.4 kg (12.6 ± 4.9 kg). Some children were on chronic phenobarbital and/or dilantin therapy (Group A), some were on other drugs (Group B), and some were not on any medication at the time of the study (Group C). Patients were not premedicated. All received 30 mg/kg of methohexital (10%) rectally just prior to the radiology procedure. The dose was repeated in children who were still awake 15 minutes after the first dose. Additional anesthetic drugs were administered if sleep did not occur 15 minutes after the second dose in order to adequately sedate the child for the radiology procedure. An intravenous line was placed immediately after sleep ensued in children who required intravenous Renografin®. Blood pressure, heart rate, heart sounds, breath sounds, the electrocardiogram, oxygen saturation of hemoglobin, and expired CO₂ were monitored. Stimulation of sleeping children was kept to a minimum in order to determine the duration of sleep after rectal methohexital administration. Children who were still asleep at the conclusion of the radiology procedure were gently lifted with a sheet onto a crib or stretcher. Monitoring devices were not removed from the patients until they were awake, in order to minimize stimulation. Routine vital signs were obtained in the recovery room. The time to sleep, the time of transfer of the patient from the radiology table to the crib or stretcher, and the time of awakening were recorded. The onset of sleep was defined as loss of consciousness, lack of response to verbal stimulation, and absence of voluntary movements when not stimulated. Awakening time was when patients opened their eyes, resumed purposeful movements or started crying. All children who were still asleep 100 minutes after the first methohexital dose were awakened in order to provide room in the recovery area for other patients. Sleep time was defined as the period of time from the onset of sleep to awakening. Transfer time was defined as the time from the administration of the initial dose of methohexital to the time of transfer. Results are reported as mean \pm SE. Statistical analysis was performed using the unpaired Student's t-test, analysis of variance, and chi-square analysis. Significance was defined as $P < 0.05$.

Results: Rectal methohexital successfully induced sleep in 33 (82.5%) of the 40 children studied. Thirty of the 33 patients went to sleep after only one dose. The time to sleep for these 30 children was 7.6 ± 0.5 minutes, and sleep time ranged from 28.5 to 95.5 minutes. The 3 patients who slept after receiving two doses of methohexital slept for 28.5, 61.5, and 69.2 minutes. The table shows the incidence of sleep and sleep times of patients grouped by drug history.

| | Group A (n=8) | Group B (n=10) | Group C (n=22) |
|---------------------|------------------|-------------------|-------------------|
| Slept (#) | 2 | 10 | 21 |
| Time to sleep (min) | 7.5 ± 0.3 | 9.9 ± 1.4 | 8.0 ± 0.8 |
| Sleep Time (min) | 55.6 ± 4.3 | 55.9 ± 6.9 | 62.5 ± 5.5 |

The incidence of sleep was significantly different between the groups ($P < 0.001$). There was no significant difference in the time to sleep or sleep time. Mean sleep time was 60.1 ± 4.1 minutes for all patients, including those 5 who were awakened 100 minutes after receiving methohexital. The two patients who woke up spontaneously before being transferred from the radiology table slept for 40.5 and 47.5 minutes. The 13 patients who were awakened during transfer slept for 39.9 ± 2.9 (range = 28.5 - 57) minutes. The transfer times of those patients and of those who remained asleep were 48.9 ± 2.5 and 40.2 ± 1.9 minutes, respectively ($P < 0.01$). The following figure shows the sleep times of children who were not awakened during transport.



Conclusions: The results of this study indicate that a 30 mg/kg dose of rectally administered methohexital provides adequate sedation of most children for CT and MRI scans. This dose, however, was not very effective in children on chronic phenobarbital and/or dilantin therapy. The data suggests that children who sleep after receiving a 30 mg/kg of rectal methohexital will sleep for at least 25 minutes, and half of them will sleep longer than 1 hour.