CLINICAL USE OF METOPRYL AS AN ANESTHETIC AGENT *

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Metopryl (n-propyl methyl ether)† has recently been carefully studied by Krantz, Evans, Carr and Kibler (1). As a result of their experimental investigation, they concluded that it compared favorably to ethyl ether as an anesthetic agent. They reported the anesthetic effect of metopryl to be 25 per cent greater than that of ether, and observed no harmful effects on the heart, liver or circulation as a result of its use. Metopryl is a volatile colorless liquid with a boiling point of 39 C., and a pungent odor. It is eliminated probably unchanged from the body at a similar or somewhat slower rate than ethyl ether. Metopryl is an isomer of ethyl ether as illustrated by the following formulas—

\[
\begin{align*}
\text{CH}_3 & \quad \text{O} \\
\text{CH}_3-\text{CH}_2-\text{CH}_2 & \\
\text{n-Propyl Methyl Ether} & \\
\end{align*}
\]

\[
\begin{align*}
\text{O} & \quad \text{CH}_3 \\
\text{C}_2\text{H}_5 & \\
\text{Ethyl Ether} & \\
\end{align*}
\]

The present report concerns the clinical use of metopryl in 500 surgical cases, in which this drug was substituted for ethyl ether. It has been used in three ways: in a limited number of cases, by the open drop technic without supplement; as a supplement to nitrous oxide anesthesia, and, most frequently, in conjunction with cyclopropane by the carbon dioxide absorption technic.

The odor of metopryl was found to be less pleasant than that of ethyl ether and on a number of occasions when the open or semi-open systems were used, the anesthetists complained of a disagreeable feeling and headache after a relatively short time. There were objections also from other operating room personnel. Using the drug daily over a period of several months did not seem to increase one’s tolerance to the characteristic odor of the drug. As a result, the open and semi-open technics were abandoned in favor of the closed carbon dioxide absorption method. It was difficult to eliminate completely the odor of metopryl from the gas machine by flushing it with oxygen. It is interesting

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to note that although the operating team reacted unfavorably to the odor of metopryl, the patients only rarely objected to it during induction.

When metopryl was administered by the open drop technic, the induction was not unpleasant to the patient but it was not as prompt or as satisfactory as that obtained with such agents as vinethene or cyclopropane. It was, however, less irritating to the patient than ethyl ether given in a similar manner. The course of anesthesia was usually satisfactory and the recovery period was similar to that encountered following ether anesthesia. There appeared to be no decrease in the time of recovery, or in the incidence of the ordinary postoperative sequelae, such as nausea, vomiting and restlessness. Better results with metopryl were obtained by using it in conjunction with nitrous oxide or cyclopropane than by using it alone. Metopryl was satisfactory as a supplement to nitrous oxide anesthesia because it was less irritating to the respiratory tract than ethyl ether and had an even greater potency. The combination of nitrous oxide and metopryl would have undoubtedly been used more extensively had it not been for its unpleasant odor. The advantage of metopryl as a supplement to nitrous oxide, however, did not seem to be sufficiently great to overcome this objection.

Since metopryl was less irritating than ether to the respiratory tract when used in ordinary concentrations, its administration could be started at the onset of cyclopropane anesthesia. The failure of metopryl to stimulate respiratory activity added to the depressing effect of the cyclopropane. High concentrations of metopryl were found to be irritating to the respiratory system, and in exceptional cases severe coughing paroxysms occurred even with minimal quantities of the drug. An advantage of metopryl anesthesia was the prompt depression of the pharyngeal reflexes, which permitted the insertion of an airway earlier than is usual when ether is used.

In the limited number of cases in which relatively deep anesthesia was attempted for abdominal procedures, it was sometimes difficult to obtain adequate relaxation without causing respiratory arrest. The degree of abdominal relaxation did not seem to be superior to that ordinarily obtained by ethyl ether. In several instances the recovery period following deep anesthesia was unusually long, and occasionally periods of restlessness and excitement were observed. Clinically, metopryl appeared to be somewhat more potent than ethyl ether, but in the average case only slightly less drug was required to produce a similar degree of anesthesia.

Metopryl did not appear to produce harmful effects on the circulation, and no cardiac irregularities were observed during metopryl anesthesia. In one case only, the blood pressure was sharply depressed when an attempt was made to obtain deep anesthesia. In several patients with preoperative cardiac arrhythmias, the use of metopryl did not appear to aggravate the irregularity.
SUMMARY

A clinical investigation of the anesthetic action of metopryl (n-propyl methyl ether) in 500 surgical cases indicated that its anesthetic properties are somewhat similar to those of ethyl ether. Metopryl was found to be slightly more potent than ether. A more significant finding was the decreased irritation of this drug on the respiratory tract. This characteristic was, in our experience, the only advantage of metopryl over ethyl ether. The relaxation afforded by metopryl did not seem to be superior to that ordinarily obtained with other agents. The analgesic properties compared favorably with those of ethyl ether.

No serious complications resulted from the use of metopryl except respiratory and circulatory depression, which was readily corrected by decreasing the concentration of the drug. Although the margin of safety of metopryl appeared to be good, there was no reason to believe that it was less dangerous than ether. In fact, it was our impression that the use of metopryl to obtain profound relaxation was more hazardous than with ether. First plane anesthesia could be obtained with a comparable degree of safety.

Metopryl has an objectionable odor which prohibited its use by the open or semi-open system. As an induction agent it is less offensive to the patient than ether but it is definitely inferior to nitrous oxide, cyclopropane or vinethene. Since metopryl is inflammable, all of the usual precautions were necessary during its use to prevent explosions.

In our experience metopryl did not seem to be of sufficient advantage over the ordinary methods of anesthesia to warrant its continued use. Additional experience with the drug will be required, however, to evaluate fully its usefulness as an anesthetic agent.

REFERENCE


MEETING OF SECTION ON ANESTHESIA OF CONNECTICUT STATE MEDICAL SOCIETY

HAMDEN HIGH SCHOOL, HAMDEN, CONN.

APRIL 29, 1947—2:30 P.M.

2. "Respiration," by Irvin Shaffer, M.D., New Haven, Conn.
3. "Cases Presenting Interesting Anesthesia Problems," by Resident Anesthesiology Staff, St. Francis Hospital, Hartford, Conn., under the direction of Stevens J. Martin, M.D.