

Letters to the Editor

Intraperitoneal ether for anaesthetizing small laboratory animals

SIR,—Ether has been used for many years to anaesthetize small laboratory animals despite the inconvenience of its administration by inhalation. In the present experiments, ether was given intraperitoneally in rats as a 40% solution in peanut (arachis) oil. Table 1 summarises the results of experiments made with groups of 10 rats (170–180 g) at each ether dose. Arachis oil controls are designated as ether 0.0 ml/kg. For assessment purposes animals were considered to be anaesthetized if they met the following criteria: (1) loss of righting reflex, (2) lack of response to pinching of the tail, and (3) lack of spontaneous voluntary movements.

As expected, all deaths were attributable to respiratory failure and could have been prevented by respiring the rats artificially, by intubation with a blunted 18 gauge hypodermic needle. Artificial ventilation regularly permitted complete recovery after the administration of otherwise lethal doses (5.00 ml/kg) of ether. Similar results were obtained in 8 cats using 2.5 and 5.0 ml/kg of ether.

TABLE 1. ETHER ANAESTHESIA IN RATS

Dose of ether ml/kg	Number anaesthetized	Duration of anaesthesia min \pm s.e.	Number of deaths
0.0	0/10	—	0/10
0.62	0/10	—	0/10
1.25	4/10	2.85 \pm 1.7	0/10
2.50	9/10	14.07 \pm 2.0	0/10
3.00	9/10	25.12 \pm 3.6	4/10
3.75	10/10	50	8/10
5.00	10/10	—	10/10

Approximately 1–2 min after injection of an anaesthetizing dose of ether, the rats became ataxic, then lost the righting reflex with attendant analgesia. Considerable muscle tone persisted as indicated by marked resistance to manual extension or flexion of the limbs. This stage was followed by loss of all voluntary movement and usually by muscle flaccidity. During recovery the animals moved their heads and attempted to right themselves. Righting efforts were generally unsuccessful for as long as 15 min after the initial head movements were noted. During this period muscle tone returned but analgesia was still marked.

Noteworthy in these experiments was the lack of “second stage excitement” which is commonly observed with inhaled ether. Moreover excessive salivation was not observed after intraperitoneally administered ether, whereas salivation usually was profuse after inhaled ether. In contrast, cats after either inhalational or intraperitoneal ether, salivated markedly.

Anaesthesia produced by the intraperitoneal administration of ether in arachis oil has been found to be entirely satisfactory for a variety of surgical procedures. Since the duration of anaesthesia is dose-related, the convenience afforded by this method of administration is apparent.

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Department of Pharmacology,
University of British Columbia,
Vancouver 8, Canada.
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H. D. SANDERS