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The Sudden Death of Mice Injected Intraorbitally with Minute Quantities of Sesame Oil.*

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In the course of an experiment designed to test the sensitivity of the harderian gland to induction of tumors, about 50 mice were injected with methylcholanthrene in 0.05 cc of sesame oil. The oil was injected intraorbitally into or near the harderian gland. The mice were lightly anesthetized with nembutal and under these conditions no immediate effect of the injection was noticed during the first 10-30 seconds after injection. As fast as the mice were injected, they were placed in a container on a shelf to recuperate from the anesthetic. During a slight interruption in the injection procedure, it was noted that all 45 of the injected mice were dead or dying. It was thought that the anesthetic might be responsible, but some of the anesthetized mice were allowed to recuperate and showed no ill effects. Unanesthetized mice were then injected with 0.05 cc of plain sesame oil. They all died with characteristic symptoms. About 10 seconds after injection they began to breathe rapidly; some of them then went into convulsions and stopped breathing 1-2 minutes after injection. Others sprang into the air and respiration ceased within 1 minute.

Various amounts of oil were injected intraorbitally into unanesthetized mice to determine the quantity necessary to produce the reaction. When water solutions were injected intraorbitally, some animals died, but the results were inconsistent. As little as 0.025 cc of any viscous oil always produced death, but the mice receiving 0.02 cc of oil usually survived. Those which did survive such minute amounts showed severe respiratory symptoms and were lethargic for several hours. Mice of both sexes and various ages all respond in a similar manner. No differences could be detected in the response of mice of mammary cancer susceptible strains (C3H and A) and mice from cancer resistant strains (C57, JK, I).

When the oil-injected mice were autopsied as soon as respiration ceased, the atria were observed to be fibrillating, but the ventricles were in diastole. It was thought that this reaction was related to the oculo-cardiac reflex. To test this hypothesis, mice were injected intraperitoneally with 0.05, 0.1, 0.3 mg of atropine sulfate. Fifteen to 30 minutes later, the mice were injected intraorbitally with 0.05 cc of sesame oil. Controls, which did not receive atropine, were injected intraorbitally with sesame oil. The controls all died within 2 or 3 minutes after injection. The atropinized mice all lived, one was subsequently injected with 0.05 cc of oil in the other orbital cavity and continued to live. The atropine paralyzes the vagus nerve and thus prevents the oculo-cardiac reflex. It is the blocking of this reflex which enables the mice to survive the intraorbital injections.

Conclusion. It was concluded that the oculo-cardiac reflex was responsible for the sudden and spectacular death of mice injected intraorbitally with minute quantities (0.02 to 0.05 cc) of sesame oil. Mice of cancer susceptible strains succumbed as readily as mice of cancer resistant strains.

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