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Excerpt from letter written by Dr. E. Mastromatteo, Division of Industrial Hygiene, Department of Health Province of Ontario, dated October 13, 1959, re Vinyl Chloride experiments on small animals. *AN 2287*

On April 14, 1959, groups of 5 animals comprising 5 mice, 5 rats and 5 guinea pigs were exposed to varying concentrations of vinyl chloride in air for a period of 30 minutes. The exposures were conducted in a special animal chamber. Concentrations of 10, 20 and 30 percent of vinyl chloride in air were used. An addendum to this letter will describe how these concentrations were calculated. An additional group of 5 guinea pigs were exposed to a concentration of 40% vinyl chloride in air on the same date. In all, 65 experimental animals were involved, including 15 control animals. The control animals comprised 5 mice, 5 rats and 5 guinea pigs, and these control animals came from the same animal stocks and were fed and housed in the same manner as the other animals.

A summary of the results obtained is given below:

Ten Per Cent Vinyl Chloride in Air

Mice	All were lying down at the end of 30 minutes showing tremors and twitching; recovery was quick in fresh air; no deaths.
Rats	All were lying still at the end of the experiment; recovery was quick in fresh air; no deaths.
Guinea Pigs	One was in side position; four were standing; recovery was quick; no deaths.

Twenty Per Cent Vinyl Chloride in Air

Mice	One mouse was dead; four were unconscious; recovery in fresh air took about ten minutes.
Rats	All unconscious with shallow, rapid respirations; recovery took about ten minutes in fresh air; no deaths.
Guinea Pigs	All were in side position; recovery in fresh air took about 20 minutes; no deaths.

Thirty Per Cent Vinyl Chloride in Air

Mice	All five mice dead.
Rats	All five rats dead.
Guinea Pigs	All five were alive but unconscious with shallow rapid respiration. One guinea pig from this group died after 24 hours.

Forty Per Cent Vinyl Chloride in Air

Guinea Pigs	Only guinea pigs were exposed. One was dead and four were unconscious at the end of the experiment. Another one died within 24 hours after exposure. Recovery after exposure to fresh air in those which survived was slow.
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Excerpt continued.....

Post Mortem Examination

All animals which died as a result of exposure to vinyl chloride on April 14th, 1959, were dissected within two hours. I carried out these dissections and I made observations on the gross changes present. Various tissues were removed and preserved in five per cent formalin for later detailed microscopic study.

The two guinea pigs showing delayed death were likewise dissected the following day.

All exposed animals which survived were killed on April 27, 1959 (13 days after they were exposed to vinyl chloride). I performed dissections on all of these and tissue specimens were also taken and preserved in five per cent formalin.

Control animals from the same animal stocks and housed under similar laboratory conditions were killed in the same manner and post mortem examinations conducted in the same way. There was, of course, no exposure to vinyl chloride with this group.

In general, all animals which died as a result of exposure to vinyl chloride showed congestion and/or haemorrhage of the lungs and congestion of the liver and spleen. The control animals did not show these changes.

I transported the tissues preserved in formalin to Dr. H. Danziger of Welland. Dr. Danziger had agreed to prepare these sections for microscopic study, and to examine them.

Yours very truly,

(Signed)

E. Mastromatteo, M.D.,
Division of Industrial Hygiene



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APPENDIX

Concentrations of vinyl chloride gas mixed with air, ranging from 5% to 40% vinyl chloride, were delivered to a 56-liter capacity animal test chamber.

Vinyl chloride gas and air were delivered through a rubber tube to the animal chamber. This tube had a glass Y with connections to 1) a "Fisher" flow meter and the vinyl chloride supply tank, and 2) a "Precision" wet-test gas meter and standard air pump. The flow rate of vinyl chloride was adjusted by means of a valve on the supply tank and of the air by adjusting the pump rate.

Fresh air and vinyl chloride in the desired proportions were obtained by the flow pool through the Y tube and rubber tube from the measured and controlled sources. The combined rate of flow for the 5% to 20% concentrations was 12 liters per min. and for the 30 and 40% concentrations the rate was 8 and 6 liters per minute respectively.



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