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*Long-Term Effects
of Intragastric Instillations
of Silastic 386 Foam Elastomer*

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LONG-TERM EFFECTS OF INTRAGASTRIC INSTILLATIONS OF SILASTIC 386 FOAM ELASTOMER

by

D. M. Smith, G. A. Drake, and J. E. London

ABSTRACT

Young male Sprague-Dawley rats (87 days old) were given a single dose [5 g/kg body weight (BW)] of Silastic 386 foam elastomer intragastrically (IG), and young female Swiss-Webster mice (83 days old) were given a single dose (5 g/kg BW) IG, or a dose (1 g/kg BW) IG on each of 5 consecutive days, of Silastic 386 foam elastomer. All animals were then maintained for the rest of their lives and autopsied at death.

No significant effects resulting from the oral administration of this material were seen in any of the rats or mice.

I. INTRODUCTION

Previously, we reported the acute toxic properties for Silastic 386 foam elastomer.¹ Here, we present life-span data and frequency of degenerative and neoplastic diseases following a single intragastric (IG) instillation of Silastic 386 foam elastomer in rats and single and multiple IG instillations in mice.

II. MATERIALS AND METHODS

A. Silastic 386 Foam Elastomer

This material was supplied in 100-g lots by Engineering Design Division, Los Alamos National Laboratory, Los Alamos, New Mexico. Before being used, it was stored in plastic bottles in our laboratory at 25°C.

B. Animals

Young, male Sprague-Dawley (S-D) rats and young, female Swiss-Webster (S-W) mice were purchased from Charles River Laboratories, Wilmington, Massachusetts. Throughout the study, the mice were housed five per polycarbonate cage and the rats were housed two per cage. All were maintained on low-dust aspen-shaving bedding material, which was changed twice a week. The rats were fed Teklad[®] Rat Diet and the mice Teklad[®] Mouse Diet (Teklad Mills, Winfield, Iowa). Chlorinated, acidified water was provided freely, and the animal holding rooms were maintained on a 12-hour-light, 12-hour-dark cycle.

C. Instillation and Follow-up

When they were 87 days old, the rats were fasted, sedated with ether, and given Silastic 386

foam elastomer suspended in corn oil (Mazola, Best Foods, Englewood Cliffs, New Jersey) IG at a 5 g/kg body weight (BW) dose. Sham controls and unmanipulated controls were included but are reported elsewhere.²

When the mice were 83 days old, they were divided randomly into two experimental groups. One group was given a single IG dose of Silastic 386 foam elastomer suspended in corn oil at the level of 5 g/kg BW. The other group was given an IG dose of 1 g/kg Silastic 386 foam elastomer in corn oil on each of 5 consecutive days. Controls were included but are reported elsewhere.²

All animals were then maintained in our animal colony for the rest of their lives. They were observed daily. Moribund animals were killed and autopsied immediately, and dead animals were autopsied as soon as possible. Complete gross and microscopic post-mortem examinations were performed. All tissues were fixed in 10% neutral acetate-buffered formalin, routinely processed, sectioned at 6 μ m, and stained with hematoxylin-eosin.

III. RESULTS AND DISCUSSION

Life-span data for the experimental groups of rats and two groups of controls show no statistically significant differences among the three groups (Table I). No significant differences in tumor incidence were found in the experimental group compared to the two control groups (Table II). The incidence of tumors was similar to that reported in other studies.^{3,4}

No significant differences in degenerative lesions were found in the experimental group com-

pared to the two control groups (Table III). The incidence of degenerative diseases in the three groups was also consistent with those reported elsewhere.⁴⁻⁶

Both experimental groups had longer median and mean life spans than the control group had, but the differences were not statistically significant (Table IV).

The incidence of tumors (except for malignant lymphoma) in the experimental groups was not significantly different from that in the controls (Table V), and is consistent with the reported incidence of neoplasms for S-W mice.⁴⁻⁶

The elevated incidence of malignant lymphoma in female S-W mice receiving five doses of the test material was statistically significant compared to controls, but this difference was not felt to be biologically significant because 31% of control female S-W mice "spontaneously" develop malignant lymphoma.* Degenerative lesions in the mice did not vary significantly in the experimental animals compared to the controls (Table VI) and were similar to those reported for S-W mice.^{4,6}

IV. CONCLUSIONS

The frequency of neoplasms and degenerative diseases in rats and mice was not affected by the administration of Silastic 386 foam elastomer. Furthermore, the life spans of the experimental rats and mice were not shortened compared to those in the control groups.

*M. W. Balk, Director of Laboratory Animal Medicine, Charles River Breeding Laboratory, Inc., Wilmington, Massachusetts, provided this information.

**TABLE I. Life Spans in Days ($\pm$ SD^a) for Rats
Single Dose Administered IG (5 g/kg BW)**

	Experimental Group (7-3-18 ^b)	Sham Control Group (7-3-8)	Unmanipulated Control Group (1-0-22)
Median	893	923	830
Mean	812 $\pm$ 234	890 $\pm$ 147	820 $\pm$ 140
Standard error	(44)	(41)	(28)

^aStandard deviation.

^bIdentification number.

**TABLE II. Tumor Incidence in Rats
Single Dose Administered IG (5 g/kg BW)**

	Experimental Group (7-3-18)	Sham Control Group (7-3-8)	Unmanipulated Control Group (1-0-22)
Malignant lymphoma	2/21 (10%)	1/10 (10%)	2/19 (11%)
Fibrosarcoma	3/21 (14%)	1/10 (10%)	0/19
Leydig cell carcinoma	1/21 (5%)	0/10	0/19
Islet cell tumors	2/21 (10%)	1/10 (10%)	1/19 (5%)
Adrenal adenocarcinoma	2/21 (10%)	1/10 (10%)	3/19 (16%)
Pheochromocytoma	1/21 (5%)	1/10 (10%)	0/19
Lung adenocarcinoma	1/21 (5%)	0/10	0/19
Myxosarcoma	1/21 (5%)	0/10	0/19
Adrenal adenoma	1/21 (5%)	0/10	0/19
Squamous cell carcinoma of skin	2/21 (10%)	0/10	0/19

**TABLE III. Degenerative Lesions in Rats
Single Dose Administered IG (5 g/kg BW)**

	Experimental Group (7-3-18)	Sham Control Group (7-3-8)	Unmanipulated Control Group (1-0-22)
Glomerulonephrosis/ glomerulonephritis	15/21 (71%)	6/10 (60%)	15/19 (70%)
Reactive hyperplasia of spleen	5/21 (29%)	3/10 (30%)	2/19 (11%)
Adrenal cortical hyperplasia	2/21 (10%)	0/10	0/19
Liver-biliary hyperplasia	1/22 (5%)	0/10	0/19

TABLE IV. Life Spans in Days $\pm$ SD (Mice)

	Single Dose ^a (7-3-14)	Five Doses ^b (7-3-25)	Control Group (7-3-7)
Median	781	861	538
Mean	767 $\pm$ 178	815 $\pm$ 214	568 $\pm$ 129
Standard error	(34)	(40)	(36)

^a5 g/kg BW IG.^b1 g/kg BW IG.**TABLE V. Tumor Incidence (Mice)**

	Single Dose ^a (7-3-14)	Five Doses ^b (7-3-25)	Control Group (7-3-7)
Lung adenoma	0/11	1/12 (8%)	3/13 (23%)
Lung adenocarcinoma	2/11 (18%)	1/12 (8%)	1/13 (8%)
Osteosarcoma	1/11 (9%)	0/12	0/13
Fibrosarcoma of subcutis	2/11 (18%)	3/12 (14%)	0/13
Reticulum cell sarcoma	1/11 (9%)	1/12 (8%)	0/13
Uterus adenocarcinoma	2/11 (18%)	0/12	0/13
Malignant lymphoma	0/11	4/12 (33%) ^c	0/13
Basal cell carcinoma of skin	0/11	1/12 (8%)	0/13

^a5 g/kg BW IG.^b1 g/kg BW IG.^cP < 0.025 compared to control group 7-3-7.**TABLE VI. Degenerative Lesions (Mice)**

	Single Dose ^a (7-3-14)	Five Doses ^b (7-3-25)	Control Group (7-3-7)
Nephrosis	1/11 (9%)	1/12 (8%)	4/13 (31%)
Spleen lymphocytic hyperplasia	2/11 (18%)	3/12 (25%)	3/13 (23%)
Pancreas nodular hyperplasia	1/11 (9%)	0/12	0/13
Parathyroid hyperplasia	0/11	1/12 (8%)	0/13

^a5 g/kg BW IG.^b1 g/kg BW IG.

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