

## Thyroiditis in Buffalo Strain Rats Ingesting 7,12-Dimethylbenz(A)Anthracene

Thyroiditis has been induced in Buffalo strain rats by several chemicals<sup>1-3</sup>. The purpose of this report is to describe thyroiditis in rats ingesting 7,12-dimethylbenz(a)anthracene.

**Methods.** Buffalo strain inbred 12-week-old male and female rats were given 0.025% 7,12-dimethylbenz(a)-anthracene (DMBA) ad libitum in Rockland laboratory meal. Males weighed an average of 295 g, and females weighed an average of 190 g. Similar groups of animals received the laboratory meal without the chemical and served as controls. Animals were exsanguinated by heart puncture after 12 weeks and complete autopsies were done. The thyroid glands were weighed. Tissues were fixed in 10% formalin and stained routinely with hematoxylin and eosin. Those of thyroid gland were also stained with periodic acid-Schiff (PAS), Perls' stain for hemosiderin, and Masson trichrome for connective tissue. Pituitaries were stained with PAS-orange G. Sera were used for determination of protein bound iodine (PBI) and total serum iodine (TSI).

**Results.** The gross and microscopic findings and sera values are given in the Table.

The males and females ingesting DMBA weighed less than the control animals at the end of the experiment. The animals given DMBA with thyroiditis weighed less

the lumens. Cysts were seen in the glands of 1 male and 2 females given DMBA. These lesions have been illustrated previously<sup>2,4-6</sup>. Control animals did not have lesions of the thyroid gland or other organs.

In the animals given DMBA the reticularis was widened and the fasciculata narrowed with focal lipid depletion in the adrenal glands. There were occasional vacuolated basophils in the pituitary gland.

The PBI and TSI values in animals receiving DMBA were slightly higher than those in the control rats.

**Discussion.** DMBA is another chemical that causes thyroiditis in Buffalo strain rats. The lesion has been described in the same strain of rats ingesting 3-methylcholanthrene (MCA) in the diet; after a single s.c. injection of MCA; or after repeated s.c. injections of trypan blue<sup>1-3</sup>. Thyroiditis was also observed in rats with carbon tetrachloride or dietary-induced cirrhosis of the liver<sup>4,5</sup>. It has been induced in Wistar strain rats by immunization with homologous or heterologous thyroid extract or with thyroglobulin in Freund's adjuvant<sup>6</sup>. Only Buffalo strain rats ingesting MCA develop thyroiditis. The lesion was not observed in ACI, Fischer, Marshall, and Osborne Mendel strain rats<sup>7</sup>.

The cause of the thyroiditis in Buffalo strain rats given chemicals is not known.

Body and thyroid gland weight and serum PBI and TSI

Group	Sex	Thyroid gland	No. of animals	Thyroiditis Mild Moderate Severe	Average beginning body wt. (g)	Average terminal body wt. (g)	Thyroid gland wt. (mg) Range	PBI Range	Average µg/100 ml	TSI Range	Average Ug %
DMBA	♀	Thyroiditis	6	1 3 2	197	232	(40-134)	78	(3.2-4.4)	3.8	(7.4-8.0)
	♀	No thyroiditis	4	- - -	201	240	(20-23)	20	(2.6-4.2)	3.7	(6.4-8.7)
Control	♀	No thyroiditis	11	- - -	185	265	(17-37)	25	(2.6-4.0)	3.0	(4.5-6.3)
DMBA	♂	Thyroiditis	4	0 3 1	257	344	(87-156)	89	(2.6-4.7)	3.2	(6.4-7.6)
	♂	No thyroiditis	6	- - -	282	351	(22-36)	27	(2.8-4.0)	3.5	(6.0-7.1)
Control	♂	No thyroiditis	12	- - -	285	410	(19-35)	31	(3.0-4.1)	3.7	(5.0-6.4)

than those that did not have lesions. Thyroiditis was seen in more of the females than in the males. The degree of thyroiditis did not vary; however, the glands weighed more in the male rats. The largest weighed 156 mg. On gross examination the glands with thyroiditis were firm and gray. Histologically, the thyroiditis was classified as mild, moderate, or severe. There were lymphocytes and a few plasma cells focally in the interstitium in mild thyroiditis.

Lymphocytes, plasma cells, and occasional macrophages containing hemosiderin were present throughout the interstitium in moderate thyroiditis. Some of the cells lining the acini were hyperplastic. These cells were columnar with acidophilic cytoplasm, oval or round nuclei, and few mitoses. In severe thyroiditis there were more plasma cells in the interstitium. The cells of most of the acini were hyperplastic. In some of the acini there were cells within the lumens.

There were epidermoid cysts in some of the thyroid glands not containing thyroiditis. The lining cells were flattened and there were sloughed degenerating cells in

**Zusammenfassung.** Bei männlichen und weiblichen Ratten des Buffalo-Stammes trat nach Verabreichung von 7,12-Dimethylbenzanthracen eine Thyroiditis auf.

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