Mastocytosis in Suckling Mice

It was reported by the authors that in suckling mice injected with mitomycin C, multiple excessive cell proliferation, hyperplasia or tumor occurred in the sites where the neural crest cells were present, and that these phenomena might be brought about by the mutation of the neural crest cells by mitomycin C[1]. During further investigation, it was noticed that localized mastocytosis occurred in suckling mice injected with mitomycin C.

Materials and methods. Mice of ICR-JCL strain, a total of 50, were injected i.p. with mitomycin C at a dose of 8 mg/kg on the 1st, 2nd, 3rd, 4th and 5th day after birth and sacrificed in the course of 24 or 48 h after injection. In each stage some of them, a total of 10, were used for the control specimens. Some of the specimens were fixed with 10% neutral formalin and decalcified with Plank-Rychlo's fluid and embedded in paraffin. Others were fixed with 4% lead acetate fluid. They were stained with hematoxylin-eosin and 1% toluidin blue fluid for the metachromasia of the mast cells.

Results and discussion. Not only the spindle-shaped cells but also the mast cells increased greatly in number, remarkably in the orofacial regions, especially in the mandibular parts, i.e. the oral mucosa membrane and the muscular tissues attached to the mandibula. The mast cells were seen abundantly among the bundles of the muscle fibres attached to the mandibula. Besides this, the localized mastocytosis was often seen in the connective tissue of the skin and muscle of the trunk or the extremities and in the bone marrow of the extremities Histologically, the specimens showed mastocytosis or mastocytoma.

According to PEARSE's hypothesis[2,3] that the cells originating from the neural crest take up the amine precursors and decarboxylate them, it is thought that

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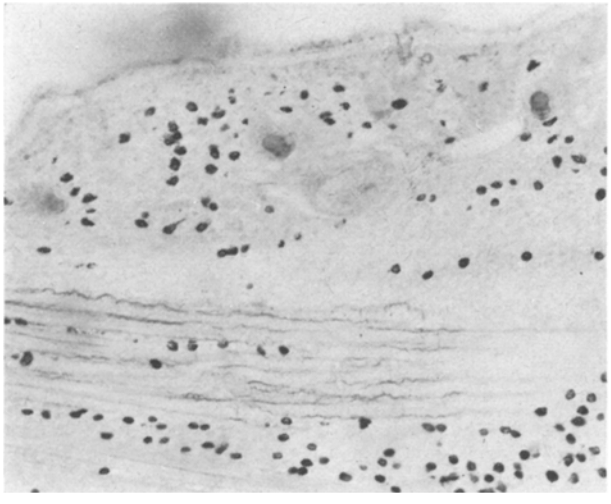

Fig. 1. Mastocytosis in the oral mucosa membrane. Toluidin blue stain. × 150.

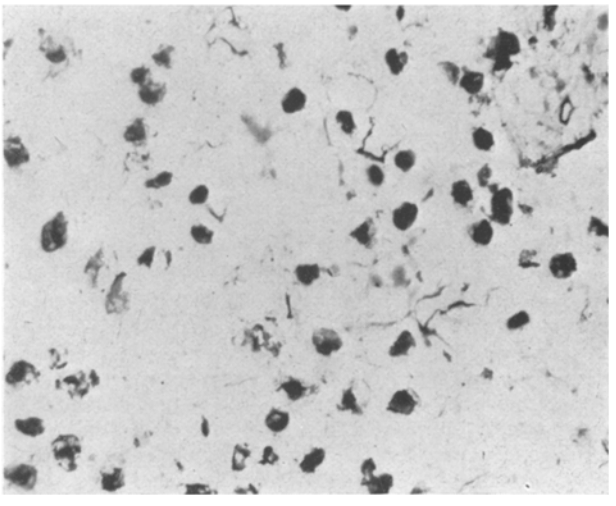

Fig. 3. Mastocytosis in the bone marrow of extremity. Toluidin blue stain. × 400.

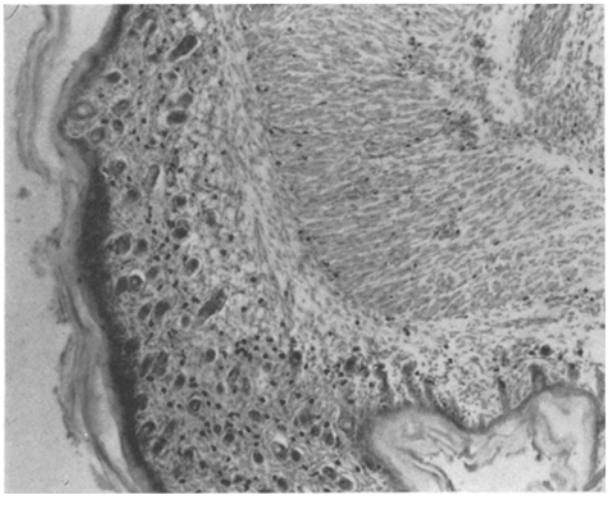

Fig. 2. Mastocytosis in the skin in the extremity. Toluidin blue stain. × 50.

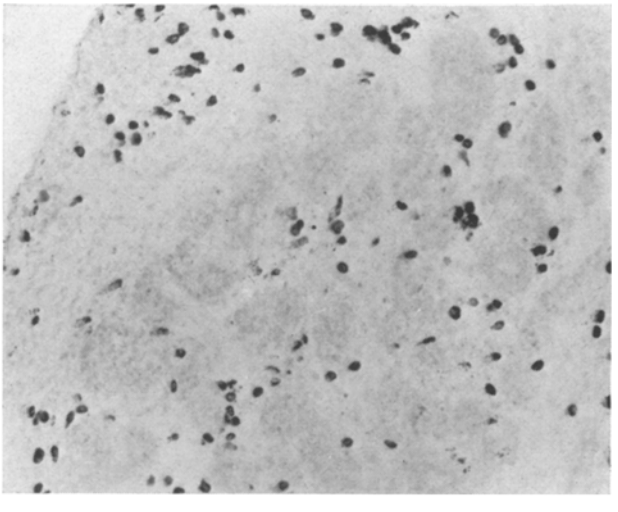

Fig. 4. Mastocytosis in the skin of the trunk. Toluidin blue stain. × 150.

the mast cells may be of neural crest origin. The sites where the neural crest cells were present in the tissues and organs in the mice embryos and suckling mice[4,5], corresponded with the sites where the mast cells were present[6]. According to SELYE[6], the following is known: accumulation of melanine in the lesions of urticaria pigmentosa has long suggested some relationship between the mast cell and pigmentation, and an unusually large number of mast cells has also been noted in xeroderma pigmentosa. A certain parallelism between the local mastocytosis and hyperpigmentation also exists in the experimentally produced pigmented dermatoses, and all these findings suggest a relationship between mast cells and melanin production. On the other hand, it is thought that xeroderma pigmentosa may be related to the neural crest cells[7]. It was found in the authors' laboratory that the neural crest cells in mice showed a specific sensitivity to the alkylating agents, and the DNA and protein of the neural crest cells disappeared[7], and furthermore in the suckling mice injected with mitomycin C, excessive cell proliferation, hyperplasia or tumor occurred. It is thought that these phenomena may be brought about by the dysdifferentiation of the neural crest cells[1]. Furthermore in suckling mice injected with mitomycin C, hyperkeratization of the skin and heterotrophic melanin pigmentation were seen[8]. From the above, it is speculated that the mastocytoma or mastocytosis in suckling mice injected with mitomycin C may be brought about by the dysdifferentiation of the neural crest cells, and that the mast cells may be of the neural crest origin.

Summary. In suckling mice injected intraperitoneally with mitomycin C on the 1st to 5th day after birth and sacrificed in the course of 24 or 48 h after injection, mastocytosis occurred in the oral mucosa membrane, skin of the trunk or extremities and bone marrow of extremities.

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Nuclear Bodies in the Hepatic Parenchymal Cells in Acute Viral Hepatitis

Nuclear bodies are a morphological entity with whorl-like configuration, reported in a variety of pathological conditions and also in normal plant and animal tissues[1,2]. BOUTEILLE et al.[2] have proposed a classification of these structures based on their ultrastructural appearance. The nature and function of these nuclear inclusions remains obscure. Some evidence supports the possibility of their being normal cell organelles related with cellular hyperactivity, increasing in number and assuming different degrees of differentiation and structural arrangement. In the course of an ultrastructural study of liver tissue from patients with acute viral hepatitis, nuclear bodies of simple and complex types were frequently found. The purpose of this paper is to report the presence of nuclear bodies in the hepatocytes in acute viral hepatitis. Our observations suggest that these structures could express liver cell hyperactivity related to the cellular regeneration after hepatic necrosis, and also be a reflection of the underlying acute viral process.

Material and methods. Liver tissue was obtained by Menghini needle biopsy from 6 patients with viral hepatitis in the 4th week after the clinical onset of the disease. Hepatitis B surface antigen (HB_sAg) was found by counter electrophoresis in 3 patients. The liver-biopsy specimens were fixed in cacodylate-buffered 3% glutaraldehyde pH 7.4 and postfixed sequentially in veronal acetate-buffered 2% osmium tetroxide pH 7.4 and veronal acetate-buffered 0.5% uranyl acetate pH 5.8[3]. Following dehydratation in graded ethanol solutions, they were embedded in Epon 812[4]. Ultrathin sections were cut with a glass knife on a LKB Ultratome, stained with lead citrate and examined on a Phillips EM 300 electron microscope, operated at 80 kv.

Results. Nuclear bodies of different morphological types were present in about 15% of nucleus sections in hepatocytes of patients with acute viral hepatitis. 1 to 4 nuclear bodies were found per nucleus. There was a type 2 and 3 bodies predominance. They were usually spherical in shape and consisted of whorls of granular and fibrillar material, varying between 0.3 to 0.5 μm in diameter and occupying the interchromatinic spaces. Often vacuolar structures and electron dense granules were observed in the centre of the nuclear bodies, surrounded by concentrically arranged fibrils. Some of these granules seemed perichromatinic granules. Some highly differentiated forms, type 4, were also present. Frequently the fibrils composing type 1 and 2 bodies were loosely circulary arranged and penetrated into the halo of electron-lucent nucleoplasm which surrounded the nucelar bodies. No differences were found either in HB_sAg positive and HB_sAg negative cases in the frequence and morphology of nuclear bodies.

Discussion. The morphological nature and the functional significance of the nuclear bodies are poorly understood. It has been pointed out by several authors that they are probably discrete intranuclear inclusions related to cell hypertrophy or pathological conditions, i.e. viral infections[5]. Their number is remarkably increased in multiplying and growing cells, and they also present more differentiated arrangements[2]. To our knowledge, no references concerning the presence of these structures in the hepatic parenchymal cells in acute viral hepatitis have been previously reported.

Both rapid cell growth and virus infection are present in acute viral hepatitis, suggesting that these factors

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