CORRESPONDENCE

Prolonged Iron-dextran Therapy

To the Editor,

The article by L. Ross and H. Fremland (Prolonged and massive administration of iron-dextran complex resulting in selective glomerular iron deposition in the kidneys. Blood 31:11, 1968) was of considerable interest. Iron-dextran injection has been of great usefulness in selected patients with chronic intestinal bleeding and in some patients with postgastrojejunostomy iron deficiency or malabsorption syndromes.

We had the opportunity, over a period of eight years, to observe and treat a 50 year old man who had continuous gastrointestinal bleeding associated with hereditary telangiectasia. During this time, he received 451 blood transfusions (estimated iron 115 Gm.); these usually followed severe acute bleeding episodes. From 1958 to 1961, he took oral iron preparations regularly. In 1961 and 1962, he was given 3.25 Gm. of an intravenous iron-dextrin preparation (dextriferron) over a period of 14 months. From 1962 to 1964, he was given 14.6 Gm. iron-dextran intramuscularly, and from 1964 to 1966, he was given 20.5 Gm. of iron-dextran intravenously on a more regular basis (usually 250 mg. once weekly). This latter routine maintained his hemoglobin at a reasonable level between acute bleeds. Marrow iron stains were no more than 1+ on a scale of zero to 6+ (Rath, C.E., and Finch, C.A.: Sternal marrow hemosiderin: method for determination of available iron stores in man. J. Lab. Clin. Med. 33:81, 1948).

Total parenteral iron administered (including blood transfusions) was estimated at 153 Gm. Of this amount, 38 Gm. were given as parenteral iron-dextran and iron-dextrin during four and one-half years (23.7 Gm. intravenously).

After reading the paper of Ross and Fremland, we reviewed the autopsy histologic sections, and were not able to demonstrate iron deposition in the kidneys or other organs. This may reflect the great amount of iron loss associated with his intestinal bleeding, the post-gastrectomy state after 1963 and the use of an amount of iron-dextran selected as the minimum necessary to maintain a level hemoglobin concentration when possible. We were not able to demonstrate hemolysis, by serial haptoglobin determinations, during the period of parenteral iron-dextran administration (Mengel, C.E., Kann, Jr., H.E., and O'Malley, B.W.: Increased hemolysis after intramuscular iron administration in patients with paroxysmal nocturnal hemoglobinuria. Blood 26:74, 1965).

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The Thymus and the Bursa

To the Editor,

Under discussion has been how the thymus and the bursa of Fabricius are related, and how each exerts distant effects on the remaining lymphoid tissues. In view of the recent experimental evidence indicating that the entodermal cells of the thymus produce a hormone which accelerates DNA synthesis and small lymphocyte growth in lymphoid tissues, it may be of interest and of importance to consider in what ways the entodermal cells of the thymus and those of the bursa are phylogenetically similar.

The entodermal cells of the thymus take their embryologic origin mostly from the entoderm of the third gill pouches, become stranded from thence into the lower neck, and become densely encased in proliferating lymphoid tissue to constitute, in conjunction with the latter, a lymphoepithelial organ of relatively great size at the time of birth. In mammals a
lymphoepithelial organ morphologically and functionally similar to the thymus remains to be identified, but is being sought in the lower small intestine and appendix. In members of the avian species, such as chickens (having relatively long necks and short trunks in comparison with developing mammals), a lymphoepithelial organ auxiliary to the thymus, morphologically similar, and in some ways functionally similar, develops in a similar manner surrounding entoderm stranded from a pouch which evaginates from the cloaca. Recently, it came to my attention at the San Diego Zoo (and it was reported in Blood) that in amphibians, such as turtles, the bursa of Fabricius, which pouches outward from the cloaca, functions as a gill carrying on respiratory gas exchange when the turtle sucks water in and out of the cloaca, and which allows the turtle to breathe when it remains submerged for relatively long periods of time.

Although all vertebrate embryos develop in the aquatic environment of the egg or of the fetal sac inside the womb, it is not clear to what extent the gill pouches or the cloacal bursa actually function as gills during the developmental stages of higher vertebrates. However, if one looks upon the bursa of Fabricius as a gill equivalent, one may look upon the entodermal cells stranded from thence as equivalent to the entodermal cells stranded from the gill pouches in the neck. As the latter, after becoming stranded, continue onward to become the endocrine cells of the thymus, thyroid, and parathyroid glands, one may suspect that the entodermal cells derived and stranded from the cloacal bursa may also assume a somewhat equivalent endocrine function. If the stranded bursal entodermal cells assume an endocrine function similar to that which has been experimentally indicated in the entodermal cells of the thymus, one may offer an explanation for some of the functional similarities which appear to exist between the lymphoepithelial bursa of Fabricius and the lymphoepithelial thymus gland. Moreover, if the stranded bursal entodermal cells, in addition, assume an endocrine function similar to that which has been found in the entodermal cells of the thyroid and parathyroids, one may offer a starting point for an explanation of why bursectomy results in a syndrome somewhat dissimilar to that which results from thymectomy in the neonatal chick. Pertinent in this situation may be that thyroid hormone and parathormone also stimulate lymphoid tissue growth, presumably by different mechanisms.

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REFERENCES

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