

The Role of Fetal-Maternal Microchimerism in Autoimmune Disease

Over the last 4 or 5 years, more and more diseases are described in which fetal cells are found at the site of autoimmune maternal disease and more recently maternal cells are being found at the site of newborn destructive ("graft-versus-host") diseases. Many diseases including systemic sclerosis and fetal dermatomyositis have now been attributed to fetal-maternal microchimerism. The report by Klinschar et al adds to the evidence that Hashimoto's thyroiditis includes fetal microchimerism in the fetal thyroid gland. These authors took thyroid gland specimens, extracted DNA, and then used Y probes to look for evidence of male cells in the maternal thyroids. They specifically used thyroid glands from women who had male children, and found evidence of male microchimerism in half the specimens. Among the controls (nodular goiter), only 1/25 specimens had evidence of Y chromosome microchimerism.

The importance of this observation is related to the question of whether the fetal cells can be a cause of autoimmune diseases since there is an excess of thyroid autoimmune disorders in females. The molecular

techniques presently used look for Y DNA probes in females and female cells in males. The new molecular techniques allow this sort of recognition. It seems likely that all of us carry some maternal stem cells and that women who have been pregnant carry fetal cells, which can respond to damage and stress. What is not clear is whether the fetal cells are the cause of auto immunity or simply represent a stem cell response to injury.

Klinschar M, et al. *J Clin Endocrinol Metab* 2001;86:2494-2498.

Editor's Comment: *It will be important to look at multiple tissues for fetal cells. It appears that pregnancies which have been complicated are more likely to have fetal cells in circulation. Thus, pre-eclampsia and aneuploidy are known to have increased trafficking between mother and fetus. In addition, loss of co-twins can predispose to microchimerism. Keep your eyes open for more work in this area since it is highly likely that additional papers will try to discriminate the source of the cells, and determine the time at which they would have migrated to specific tissues.*

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Table

Number of children, sons, and daughters in Hashimoto patients with and without detectable microchimerism

Patient no.	No. of children	No. of daughters	No. of sons	Microchimerism
1	4	2	2	Yes
2	1	0	1	Yes
3	3	1	2	Yes
4	2	1	1	Yes
5	2	1	1	Yes
6	2	1	1	Yes
7	4	1	3	Yes
Mean	2.57	1	1.57	
9	1	0	1	No
10	2	1	1	No
11	1	0	1	No
12	1	0	1	No
13	0	0	0	No
14	0	0	0	No
Mean	0.83	0.17	0.67	
P value	0.009	0.013	0.035	

Patients with microchimerism have significantly more children (sons and daughters) than patients without microchimerism, whereas no differences were found between the latter patients and controls.

Adapted from Klinschar M, et al. *J Clin Endocrinol Metab* 2001;86:2494-2498.