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Antisperm Autoantibody Response After Unilateral Vas Deferens Ligation in Rats: When Does it Develop?

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Unilateral obstruction or injury to the vas deferens can result in significant injury to the contralateral testicle. Antisperm autoantibodies are thought to play a significant role in this phenomenon. It has been reported that early surgical repair of the vas, before the development of antisperm autoantibodies, will prevent any potential damage to the contralateral testicle. This led us to investigate the timing of the antisperm antibody production and to attempt to determine whether antibody production precedes histologic testicular damage in the Lewis rat model. In a controlled study, mature rats were divided into temporal groups, with the experimental animals all receiving a unilateral vasectomy. At postoperative endpoints of 1, 7, 15, or 30 days, blood samples were collected for immunologic assay, and the testicles were harvested for histologic examination. Antibody levels were measured by an immunobead test using goat anti-rat immunoglobulin G (IgG)-coated Sepharose beads; tissue sections were fixed in Bouin solution, embedded in paraffin, and stained with hematoxylin and eosin. There was no statistically significant histologic difference between any of the groups. However, immunologic evaluation revealed a statistically significant increase in immunobead antibody binding in the 30-day group compared to the control groups ($P = .02$). These data seem to indicate that in this model, antisperm antibody production is not evident until 15-30 days after unilateral injury to the vas deferens occurs, and the development of these antibodies precedes any demonstrable histologic damage to the testicle. If it is correct to infer that human antisperm antibody production will also precede histologic testicular damage, and further, that the onset of the human autoantibody response may vary from several days to weeks, then in cases of suspected or known ductal injury, the clinical monitoring of antisperm antibody levels could enable testicular damage to be predicted prior to its development and thus be avoided.

Key words: Autoimmune response, vasectomy, testicular damage, immunologic infertility

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