The Influence of Endometriosis on Early Embryonic Development. A Study in the Rabbit

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Endometriosis has an adverse effect on fertility. In severe endometriosis adhesions interfere with ovulation and tubal function. The mechanism by which mild endometriosis causes infertility remains unclear. We studied the effects of endometrial implants on early embryonic development in the rabbit. In 50 virgin Dutch belted rabbits 1 cm of the right uterine horn was resected and divided in four equal parts. Adipose tissue was resected from the juxtauterine fat. In 25 rabbits (group I) the endometrial tissue was sutured onto the peritoneum at the right lateral abdominal wall using 6.0 prolene, the fat was discarded. In 25 rabbits (group II) the fat was sutured onto the peritoneum in the same way, the endometrial tissue was discarded. After a recovery period of 12 weeks the does were mated and sacrificed 24 h after mating. The abdominal cavity was carefully inspected for adhesions. The oviducts were flushed after excision and checked for the presence of embryos. Parameters of embryonic development were studied. In group I the implantations led to cysts filled with yellow or brown fluid. Histological examination revealed endometrial glands and stroma in all specimens. Adhesions were absent in 4, mild in 8 and moderate in 13 rabbits. The ovaries and oviducts were completely free of adhesions in all rabbits. In group II the fat tissue had not changed. Adhesions were absent in 17, mild in 6 and moderate in 2 rabbits. The number of corpora lutea, the fertilization rate and tubal transport did not differ significantly in the groups investigated. Embryonic cleavage stage was not different in either group 24 h after mating. From these data we conclude that endometrial implants onto the peritoneum in rabbits do not influence the ovulatory mechanism, the fertilization of the ova, the embryonic cleavage and the tubal transport of the fertilized ova in the first 24 h after mating. From in vitro fertilization studies it is known that in patients with mild endometriosis there is a normal capacity of the ovaries to be fertilized and to cleave. Our data obtained in an experimental model seem to support these findings and suggest a post-fertilization problem responsible for the reduced fertility in mild endometriosis.

Chemiluminescence of Peritoneal Macrophages in Endometriosis

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In recent years much attention has been paid to the possible role of peritoneal fluid constituents in the etiology of subfertility in endometriosis. We studied the functional activity of macrophages in the peritoneal fluid. Peritoneal fluid was collected in the periovulatory phase of the cycle in 29 women undergoing laparoscopy. At laparoscopy

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endometriosis was diagnosed in 29 patients (AFS I: n = 11, AFS II: n = 4), in 14 patients no endometriosis was found. No major abnormalities were seen in either group. Peritoneal fluid was collected from the pouch of Douglas under direct vision. The fluid was collected in glass tubes and anticoagulated with 1.5 mg/ml ethylenediaminetetraacetic acid. After collection the tubes were put on ice. The total volume, the number of cells per ml and the viability of the cells was determined. A differential count of the cells was made. The phagocytosis by peritoneal macrophages of sheep red blood cells and the level of chemiluminescence of the peritoneal macrophages after phagocytosis of zymosan particles were measured. In endometriosis the number of cells per ml was higher than in controls. There was no difference in peritoneal fluid volume or in the relative amounts of macrophages. The sheep red blood cell phagocytosis was significantly increased in endometriosis patients. The peritoneal macrophages of endometriosis patients showed lower levels of chemiluminescence. From these data can be concluded that peritoneal macrophages of patients with endometriosis have a higher phagocytic capacity than controls. The higher phagocytic capacity is not reflected however in enhanced levels of chemiluminescence of the peritoneal macrophages. This phenomenon is not easily explained. It might reflect an altered immunological state of the macrophage that allows the development of endometriosis.

CA-125 and Endometriosis:

An Epidemiological Study of a Müllerian Antigen

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OC-125 is a monoclonal antibody which reacts with CA-125, a circulating antigen expressed by müllerian tissues. Previously we observed an increase of CA-125 in epithelial ovarian carcinoma, adenoma corporis uteri, tuboovarian abscess, pyosalpinx, endometriosis; in normals in menstrual cycle in ovulatory cycle, in ovarian hyperstimulation. We examined 77 cases of endometriosis: 41 ovarian simple endometriotic cyst, 7 associated with uterine myoma, 9 adenomiosis, and 27 peritoneal involvement. Levels ranged in all cases 6-530 ng/ml, in ovarian endometriosis 42-530, in the presence of myoma 35-135, adenomiosis 12-35, peritoneal involvement 6-121. Peritoneal fluid levels were higher than serum.

Day-to-day variations and circadian rhythm were absent. CA-125 levels after surgery decreased into normal in a week for ovarian endometriotic cyst. There is no correlation of serum CA-125 levels and the classification we use for endometriosis. We observe the presence of a correlation only in the presence of endometriotic cyst or extensive peritoneal involvement and large quantities of peritoneal fluid. CA-125 actually provides a very low sensitivity for monitoring endometriosis but it is very important to study the correlation endometriosis, ovarian endometriosis, peritoneal fluid and peritoneal involvement. Only in the presence of accurate protocols can we use, in the future, this miillerian antigen during follow-up in the treatment of endometriosis. Initially we can use CA-125 in the follow-up of endometriotic ovarian cyst and in the far future the peritoneal endometriotic site, but obviously not for screening.