

Does NETosis in Endometriosis Depend on the Stage of Endometriosis Progression?

Abstract ID : 2446

Submitted by : Yunlei Cao the 2017-01-25 07:05:46

Category : SEUD CONGRESS

Typology : Communication orale / Oral communication

Status : Validated

Authorisation to disclose : Yes/Oui

Introduction: Neutrophils constitute the first line of defense of the innate immune system and are important for controlling and eliminating microbial infections. They eliminate microbes by phagocytosis, degranulation, and the release of neutrophil extracellular traps (NETs) which consist of decondensed chromatin in complex with antimicrobial factors and are thought to control microbes. Chromatin and proteases released into the circulatory system during NET formation, called NETosis, can regulate procoagulant factors. It is reported that the peritoneal fluid from women with endometriosis contains higher levels of NETs than that from women without endometriosis. However, it is unclear as whether the plasma NETs levels are also elevated in women with endometriosis, and, if so, whether they are associated with the stage of the development of endometriosis, namely platelet-driven fibrogenesis. In this study, we tested the hypothesis that the plasma NETs levels are correlated with the developmental stage of the endometriosis using a mouse model of endometriosis. We tested the hypothesis that the NETs levels may correlate with the rASRM scores and that they may be reduced after surgical removal of endometriotic lesions.

Materials and Methods: Twenty-four female Balb/C mice were randomly divided into two groups: the ENDO group (n=16) which received an endometriosis-induction procedure, and the ConTRoL group (n=8) which received a sham induction. For ENDO mice, half of them were randomly selected and sacrificed 2 weeks after induction (ENDO2), and the another half, 4 weeks after induction (ENDO4). The CTRL mice were sacrificed 4 weeks after the induction. Before sacrifice, blood samples were collected from all mice, which were subjected to the measurement of circulating free DNA (cf-DNA) and myeloperoxidase (MPO)-DNA levels by ELISA. In addition, peripheral blood samples were collected from 25 women without endometriosis and 36 patients with histologically confirmed endometriosis before and 3 months after the surgical removal of endometriotic lesions. Their plasma cf-DNA and MPO-DNA levels by quantified and analyzed. Results: The lesion weight in ENDO4 mice was 2.5 fold heavier than that of ENDO2 mice. The plasma levels of both cf-DNA/NETs in ENDO4 group were significantly higher than that of CTRL group and also of the ENDO2 group. The plasma MPO-DNA levels in fact correlated positively with the lesion weight ($r=0.83$, $p<0.001$). In humans, both preoperative plasma cf-DNA and MPO-DNA levels in women with endometriosis were significantly elevated as compared with the that in controls (both p-values <0.001). However, both post-operative plasma cf-DNA and MPO-DNA levels were significantly reduced as compared with the pre-operative levels and were statistically no different from those of controls. The pre-operative plasma MPO-DNA levels correlated positively with the rASRM scores of endometriosis ($r=0.95$, $p<0.001$).

Conclusion: Our results suggest that the plasma NETs levels appear to correlate with the extent or stage of endometriosis progression, due possibly to the different NETosis processes, as supported by the return to normal NETs levels after the removal of endometriotic lesions. If further confirmed, plasma NETs levels may be used as a biomarker for the diagnosis and staging of endometriosis.

Keywords : endometriosis, neutrophil extracellular traps (NETs), circulating free DNA (cf-DNA), myeloperoxidase (MPO)-DNA, biomarker

Authors :

References : , , ,

Authors

Yunlei Cao 1, Xishi Liu 2, Sun-Wei Guo 2,

1. Fudan University, Shanghai Obstetrics and Gynecology Hospital, Shanghai, CHINA

2. Fudan University, Shanghai Obstetrics and Gynecology Hospital, Shanghai Key Laboratory of Female Reproductive Endocrine-Related Diseases, Shanghai, CHINA

Authors (raw format)

Cao Yunlei - email : cyl_fd@126.com Institution : Shanghai Obstetrics and Gynecology Hospital Department : Fudan University City : Shanghai Country : CHINA Speaker : Yes

Liu Xishi - email : lxsdoc@hotmail.com Institution : Shanghai Obstetrics and Gynecology Hospital, Shanghai Key Laboratory of Female Reproductive Endocrine-Related Diseases Department : Fudan University City : Shanghai Country : CHINA Speaker : No

Guo Sun-Wei - email : hoxa10@outlook.com Institution : Shanghai Obstetrics and Gynecology Hospital, Shanghai Key Laboratory of Female Reproductive Endocrine-Related Diseases Department : Fudan University City : Shanghai Country : CHINA Speaker : No

