הכינוס השנתי ה-66 של
האגודה הישראלית לחקר הפוריות (אי"ה)
7 במאי 2024, מלון דיוויד אינטרקונטיננטל, תל אביב
האגודה הישראלית לחקר הפוריות (אי"ה)
THE ISRAEL FERTILITY ASSOCIATION (IFA)
الجمعية الإسرائيلية لأبحاث الخصوبة

Alterations of implantation genes and dendritic cells in endometrial samples after antibiotic treatment

Baraa Darawshe, Shay Hantisteanu, Shilhav Meisel Sharon, Gabriel Groisman, Sergio Haimovich, Einat Shalom-Paz

[1]IVF Unit, Hillel Yaffe Medical Center, Hadera, Israel
[2]Rappaport Faculty of Medicine, Technion–Israel Institute of Technology, Haifa 3109601, Israel

Abstract

Chronic Endometritis (CE) is characterized by persistent inflammation in endometrium. Inflammation alters endometrial immune components, which may impair endometrial function and result in reduced embryo receptivity [1]. It is well-established that the success of embryo implantation depends on the complex communication of embryo quality, uterine integrity, and endometrial receptivity [2], [3].

This retrospective study assessed the impact of CE on the expression of implantation genes HOXA10 and IGF-1 and on dendritic cells before and after antibiotic treatment, as well as on clinical reproductive outcomes. The study was conducted between 2021–2022. Ten ART patients who underwent an endometrial biopsy before antibiotic treatment, confirming the diagnosis of CE, and a second biopsy after completing a course of antibiotics for 14 days were included. Paraffin-embedded endometrial samples from these patients were obtained from the pathology department. The samples were evaluated for quantifying implantation genes HOXA10 and IGF-1 using RT-PCR, and for identification of dendritic cells using immunohistochemical staining of CD141. Conceptions and live births were also evaluated.

Results

10 samples were examined by PCR for the expression of implantation genes: HOXA 10 and IGF-1 before and after antibiotic treatment. Samples were obtained from women before and after antibiotic treatment. Figure (1) depicts the expression fold change of IGF1 gene before and after antibiotic treatment. Whereas, figure (2) depicts the expression fold change of HOXA 10 gene before and after antibiotic treatment.

Implantation gene expression was increased after antibiotic treatment. IGF1 gene expression increased 31 folds after antibiotic treatment, whereas HOXA10 expression was increased 3.5 folds after antibiotic treatment. Of our population 7 patients participating in this study succeeded to conceive after the completion of antibiotic treatment by IVF.

As for the IHC staining, it shows that the inflammation markers are reduced after antibiotic treatment as shown in figures (3) and (4). The results indicate that the intervention decreased the DC staining.

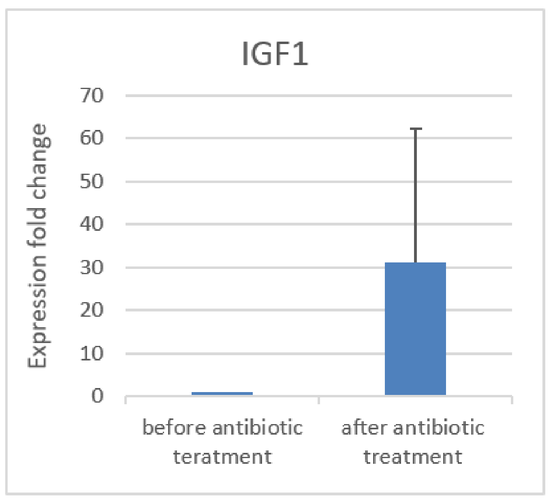

Figure (1): IGF1 gene expression fold change before and after antibiotic treatment

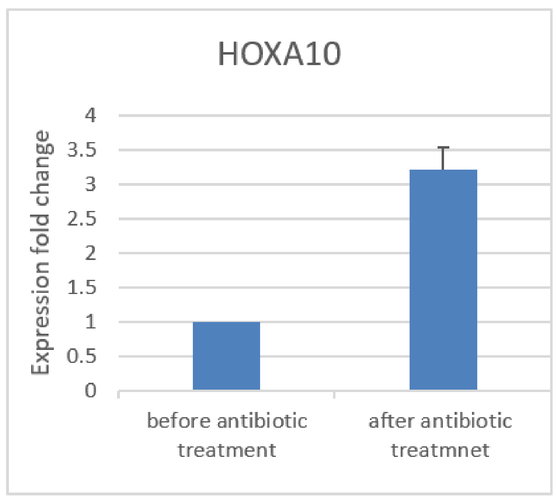

Figure (2): HOXA10 gene expression fold change before and after antibiotic treatment

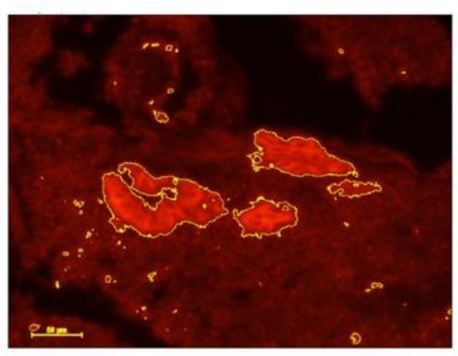

Figure 3. Endometrial samples with CD141 staining (highlighted area) before antibiotic treatment

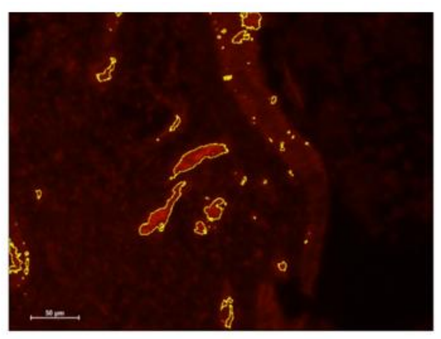

Figure 4. Endometrial samples with CD141 staining (highlighted area) after antibiotic treatment

Conclusion

In this study we show that antibiotic treatment increase the expression of *IGF1* and *HOXA10* genes in endometrial samples, with positive fertility effects. Furthermore, we have observed that a substantial number of patients in our study required a broader spectrum of antibiotic treatment, potentially attributed to the severity of CE in these women. However, to establish statistical significance, a larger sample size is required.

Reference

1. Kitaya K, Matsubayashi H, Yamaguchi K, et al. Chronic Endometritis: Potential Cause of Infertility and Obstetric and Neonatal Complications. *Am J Reprod Immunol*. 2016;75(1):13-22. doi:10.1111/aji.12438
2. Zhang Y, Xu H, Liu Y, et al. Confirmation of chronic endometritis in repeated implantation failure and success outcome in IVF-ET after intrauterine delivery of the combined administration of antibiotic and dexamethasone. *Am J Reprod Immunol*. 2019;82(5):1-9. doi:10.1111/aji.13177
3. Cicinelli E, Vitagliano A, Kumar A, et al. Unified diagnostic criteria for chronic endometritis at fluid hysteroscopy: proposal and reliability evaluation through an international randomized-controlled observer study. *Fertil Steril*. 2019;112(1):162-173.e2. doi:10.1016/j.fertnstert.2019.03.004