Dysregulated microRNA profile in peritoneal fluid from patients with endometriosis

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It has been described that both endometrial and peritoneal factors are involved in the pathogenesis of endometriosis. Previous results have pointed to the ability of peritoneal fluid (PF) from patients modifying angiogenesis-related microRNAs (miRNAs) and angiogenic factors in endometrial and endometriotic stromal cells from control women and patients. miRNAs are non-coding RNAs that regulate the translation of their target mRNAs. Not only have miRNAs emerged as potential biomarkers but also their role as inter-cellular communicators has been widely studied. In order to better understand the role of the peritoneal microenvironment, the aim of this study has been to assess the miRNA profiles in PF from patients and control women and to evaluate the main pathways affected by those miRNAs differently expressed between both groups.

Material and methods: miRNAs profiles in PF from patients (n=6) and controls (n=6), paired by menstrual phase and age, were performed using the Affymetrix platform (GeneChip miRNA 4.0) and results were analyzed with Partek Genomic Suite software. Enrichment analysis was performed employing the miRWalk 2.0.

Results: The PCA and hierarchical cluster analysis revealed that PF from patients clustered separately from controls. After statistical analysis, 126 mature miRNAs were found to be differentially expressed (p<0.05; +1.2-fold change) (48 up-regulated and 78 down-regulated). Based on KEGG Database, miRNAs with significantly different levels between both groups were mainly regulators of pathways altered in cancer, such as angiogenesis, proliferation or remodelling of the extracellular matrix. Some of the most affected miRNAs were miR-486-5p (p=0.038; FC=8.23), miR-451a (p=0.034; FC=4.17), miR-3621 (p=0.012; FC=-4.73) and miR-3180-3p (p=0.032; FC=-3.66) which target genes are directly involved in important signalling pathways such as Wnt or angiogenesis.

Conclusions: PF from patients with endometriosis presented a different miRNA profile compared to control PF. Due to the miRNA ability in cell-to-cell communication; this finding could be useful to better understand the peritoneal alterations in women with endometriosis, although additional experiments are required in order to validate these findings.

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