SUMMARY

Endometriosis is defined as the presence of functional glands and stromal tissue outside the uterine cavity. The prevalence of endometriosis in the female population is estimated at 5 to even 40%. The pathogenesis of endometriosis is unknown, there are only theories trying to explain the pathomechanism of this disease.

Both endometriosis and ovarian cancer, due to the wide spectrum of ailments and diagnostic difficulties, are diseases that still require improvement and facilitation of diagnosis and monitoring of the neoplastic process.

The aim of this study was to evaluate the suitability of the Surface Plasmon Resonance Imaging (SPRi) technique for the determination of IL-6 and CA125, HE4 antigens in ovarian cancer and endometriosis.

The results obtained with the new method were compared with commercially available methods for the determination of CA125, HE4 antigens and IL-6. In addition, the validation of the SPRI method for CA125, HE4 and IL-6 antigen determinations was confirmed, and the potential use of this method in routine laboratory diagnostics was demonstrated.

The material was blood collected from two groups of patients who underwent surgery due to endometriosis (25) and ovarian cancer (7) at the Department of Gynecology and Gynecological Oncology of the Medical University of Bialystok. 2 ml of whole blood was collected from operated patients at the following intervals: before surgery, 6 and 24 hours after the surgery.

The blood was centrifuged for 15 min in a centrifuge at 2500 rpm. The obtained serum was frozen at -70 degrees C and then used for further research.

The control group consisted of plasma from healthy womens (18) obtained at the Regional Blood Donation Centre.

For the determination of the CA125, HE4 and IL-6 marker, single SPRI biosensors were constructed, and then a gynecological and oncological panel was created to enable the determination of several markers simultaneously in real time. For comparison purposes, the CA125 marker was tested with the Architect CA125 standard test, the HE4 and IL6 markers with the Elecsys standard test on a COBAS E - 411 analyzer.

A comparative analysis of the concentration measurements of the tested parameters using a biosensor and commercial methods was carried out. For statistical purposes, the Spearman and Pearson correlation test was used.

Demonstrated:

- positive correlation between the determination of CA125 concentration using the biosensor method and the traditional method in the case of endometrial cysts ($r=0,7775$, $p<0,0001$) and ovarian cancer ($r=0,6195$, $p<0,05$),

- positive correlation between the determination of HE4 concentration using the biosensor method and the traditional method in the case of endometrial cysts ($r=0,9189$, $p< 0,05$) and in the case of ovarian cancer ($r=0,9720$, $p< 0,0001$),

- positive correlation between the determination of interleukin-6 concentration using the biosensor method and the traditional method in the case of endometrial cysts ($r=0,6309$, $p< 0,0001$) and in the case of ovarian cancer ($r=0,9327$, $p< 0,05$).

Comparative analysis and validation of the obtained results showed the diagnostic usefulness of single biosensors in diagnosis of ovarian cancer and endometriosis. The results obtained using the panel are very similar to the results obtained using commercial tests used in the laboratory.