Abstract

Introduction: The main goal of our work was to compare the diagnostic accuracy of ultrasound examination and magnetic resonance imaging (MRI) in the assessment of deep endometriosis in the pelvis. Our second aim was to establish a learning curve of a sonographer and a radiologists (non-experts). As an introduction to the subject we have published 3 reviews on the diagnosis and one narrative review on the classification systems in the evaluation of endometriosis has been submitted for publication.

Methodology: Reviews were written as narrative reviews based on PubMed search and scientific societies recommendations. We have offered participation to all patients in the endometriosis centre with high suspicion of deep endometriosis, who then underwent examination by ultrasound and MRI by expert and non-expert before their surgical treatment, all findings described according to the consensus IDEA (international Deep Endometriosis Analysis group, 2016). Surgical and histological findings were used as a reference standard. Learning curve was defined as an improvement in accuracy in three blocks, into which the patients were assigned in the chronological order.

Results of the scientific studies: From 07/2016 to 02/2018 the participation was offered to 111 patients, 51 underwent both imaging examinations and 49 were included in the diagnostic study. Only 35 patients agreed to the examination by non-expert. Expert ultrasound and MRI had the same diagnostic accuracy in the detection of deep endometriosis in the upper rectum (both sensitivity and specificity 100 %) and rectosigmoid (sensitivity 94 % and specificity 84 % for both methods). Ultrasound had higher specificity than MRI in the detection of deep endometriosis in the bladder (100 % vs. 95 %), uterosacral ligaments (67 % vs. 60 %), vagina (100 % vs. 95 %) and rectovaginal septum (100 % vs. 93 %). On the other hand, sensitivity of deep endometriosis detection was lower for the ultrasound examination compared to MRI in the bladder (89 % vs. 100 %), uterosacral ligaments (74 % vs. 94 %), vagina (55 % vs. 73 %), rectovaginal septum (67 % vs. 83 %). The difference in the accuracy of the two methods was not statistically significant with the exception of uterosacral ligaments, where MRI was better ($p = 0.04$). Non-expert sonographer's learning curves were positive in the assessment of frozen pelvis ($\kappa = 0.90$, $p = 0.01$), overall assessment of deep endometriosis of the bowel ($\kappa = 1.00$, $p = 0.01$) and both non-experts had positive curves in the detection of adenomyosis (sonographer $\kappa = 1.00$, $p = 0.09$, MRI $\kappa = 0.42$, $p = 0.09$) and deep endometriosis of the bladder (sonographer $\kappa = 1.00$, $p = 0.01$, MRI $\kappa = 1.00$, $p = 0.01$).

Conclusion: Ultrasound examination and MRI had similar accuracy in the detection of pelvic endometriosis. The use of IDEA recommendation for the description of the endometriosis extent is feasible for ultrasound and MRI as well as intraoperative assessment. Non-expert sonographer's learning curve was positive in more areas.

Keywords: endometriosis, ultrasound, magnetic resonance, laparoscopy, learning curve