2022-RA-767-ESGO MACHINE LEARNING TO IMPLEMENT THE ACCURACY OF MAGNETIC RESONANCE IMAGING (MRI) IN THE DETECTION OF LYMPH NODE METASTASIS IN PATIENTS WITH LOCALLY ADVANCE CERVICAL CANCER TREATED WITH NEOADJUVANT CHEMOTHERAPY

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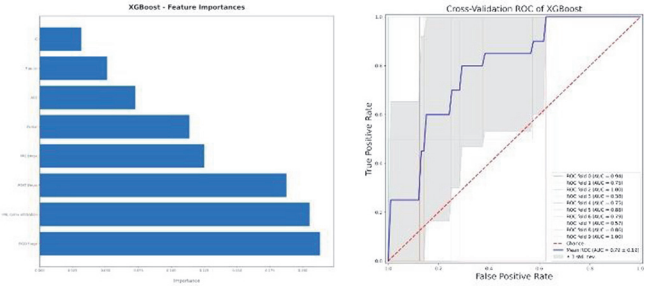
Introduction/Background Concurrent cisplatin-based chemotherapy and radiotherapy plus brachytherapy is standard treatment for locally advanced cervical cancer (LACC). Platinum-based neoadjuvant chemotherapy (NACT) followed by radical hysterectomy is an alternative approach reserves for patients with stage IB2-IIB disease. Therefore the correct pre-treatment staging is essential to the proper management of this disease. Pelvic magnetic resonance imaging (MRI) is the gold standard examination but studies about MRI accuracy in the detection of lymph node metastasis in LACC patients show conflicting data. Machine learning (ML) is emerging as a promising tool for unraveling complex non-linear relationships between patient attributes that cannot be solved by traditional statistical methods. Here we investigated whether ML might improve the accuracy of MRI in the detection of lymph node metastasis in LACC patients.

Methodology We analyzed retrospectively LACC patients who underwent NACT and radical hysterectomy from 2014 to 2020. Demographic, clinical and MRI characteristics before and after NACT were collected, as well as information about post-surgery histopathology. Random features elimination wrapper was used to determine an attribute core set. A ML algorithm,namely Extreme Gradient Boosting(XGBoost) was trained and validated with 10-fold cross-validation.The performances of the algorithm were assessed.



Abstract 2022-RA-767-ESGO Figure 1 Panel A. Feature importance of the attribute coreset. Panel B. ROC curve for XGBoost algorithm

Results Our analysis included n.92 patients. FIGO stage was IB2 in n.4/92(4.3%), IB3 in n.42/92(45%), IIA1 in n.1/92 (1.1%), IIA2 in n.16/92(17.4%) and IIB in n.29/92(31.5%). Despite detected neither at pre-treatment and post-treatment MRI in any patients, lymph node metastasis occurred in n.16/92(17%)patients.The attribute core set used to train ML algorithms included grading, histotypes, age, parity, largest diameter of lesion at either pre and post-treatment MRI,presence/absence of fornix infiltration at pre-treatment MRI and FIGO stage(Figure1-PanelA). XGBoost showed a good performance (accuracy 89%, precision 83%, recall 78%, AUROC 0.79, Figure 2-PanelB).

Conclusion We developed an accurate model to predict lymph node metastasis in LACC patients in NACT,based on a ML algorithm requiring few easy-to-collect attributes.

2022-RA-776-ESGO VALIDITY OF WHOLE BODY MRI IN THE PREOPERATIVE ASSESSMENT OF OVARIAN CANCER: SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction/Background There is no consensus on the gold standard method for the preoperative evaluation of peritoneal carcinomatosis from ovarian cancer.This systematic review aims to determine the usefulness of whole-body MRI in the preoperative assessment of ovarian cancer based on the available evidence.

Methodology A systematic review of the literature was performed in PubMed, Web of Science and Scopus. Inclusion criteria were prospective or retrospective studies in English or Spanish comparing whole-body MRI findings grouped into zones according to the peritoneal carcinomatosis index (PCI) with operative findings at laparotomy and/or histology. Sensitivity and specificity for the detection of peritoneal disease by whole-body MRI, as well as post-test probabilities and ROC curve in each zone were calculated. A QUADAS-2 was performed for quality-of-evidence analysis and risk of bias. Heterogeneity was calculated through Cochran's Q and I2.

Results A total of 104 articles were found. Afte the inclusion and exclusion criteria were applied, 5 articles were included, with 275 women with suspected ovarian cancer being assessed through whole-body MRI. Specificity was greater than 75% in all anatomical areas and sensitivity less than 75% in all areas, except in areas **PCI 0** 86% (95% CI, 76–92%), **PCI 1** 75% (95% CI, 68–81%), **PCI 4** 80% (95% CI, 54–93%), **PCI 6** 86% (95% CI, 63–95%). PCI areas 5 and 7 were not evaluated because there were insufficient data in the articles reviewed.

Conclusion Whole body MRI has a high specificity to exclude the presence of peritoneal carcinomatosis in all areas of the PCI while the sensitivity varies depending on the area, being high in the center of the abdomen (PCI 0), right hypochondrium (PCI 1), left flank (PCI 4) and pelvis (PCI 6).