Determining a prognostic score using imaging to assess the benefit of combotherapy versus monotherapy immune checkpoint inhibitor(s) in patients with metastatic MSI colo-rectal cancer

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OBJECTIVE
To determine the response to immune checkpoint inhibitors (ICI), comparing mono- and combo-therapy, in patients with microsatellite instability-high (MSI-H) metastatic colorectal cancer (mCRC) by analyzing quantitative imaging data from baseline CT-scans and clinical factors.

PATIENTS AND METHODS

- Retrospective - Multicenter (St-Antoine and Gustave Roussy hospitals)
- Inclusion: 150 patients treated by mono-therapy or combo-therapy ICI
- Split in 2 cohorts: training (105) and validation (45)
- Baseline chest-abdomen-pelvis CT-scans annotated by 6 expert radiologists
- Each tumoral lesion freehand circumscribed and labeled by organ
- Total tumor volume computed by summing the volume of each lesion
- Cox model predicted Overall Survival (OS) and Progression-Free Survival (PFS)

QR code 1. Patient characteristics from the training and validation cohorts.

QR code 2. Examples of annotated CT-scans with global representation of tumor distribution on scout view. Highly disparate populations despite identical stages.

QR code 3. Pre-study of inter-correlation coefficient of radiological annotations.

RESULTS

CONCLUSION

- Total tumor volume, combined with the number of lesions and the presence of peritoneal carcinomatosis assessed on baseline CT-scans, has a prognostic significance in MSI-H mCRC.
- Especially when associated with relevant clinical variables and integrated into a simple risk score, such as age in our ICI score, which has been able to predict the response to immune checkpoint inhibitors with mono- or combo-therapy.
- This score could guide the choice of immunotherapy for MSI-H mCRC, avoiding unnecessary higher toxicity and cost.