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1599P Management optimization of non small cell lung cancer (NSCLC) specimens. A single institution experience with a multiplexed mass spectrometry approach

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Background: Molecular characterization of NSCLC has improved significantly in the last few years and multigenes diagnostic platforms spread in clinical molecular laboratories for the advantage of their multiplexed approach added to the requirement of a very low amount of DNA, compared to conventional methods. The main goal for NSCLC sampling management is the optimization of either cytological and histological specimens to guarantee immunophenotyping of the tumour with all genomic data for targeted therapies. However, DNA yield is often very critical and low tumour cells enrichment requires high analytical sensitivities.

Methods: In the period January 2014-March 2016, we genotyped 438 NSCLC by multiplexed mass spectrometry on Agena MassARRAY® System (Agena Bioscience) with CE-IVD Myriapod® Lung status kit (Diatech Pharmacogenetics), a target assay that investigates more than 230 mutations on 10 genes involved in NSCLC, with a DNA amount of at least 40 ng. In 35% of cases, cytological samples were the only available diagnostic material.

Results: In 102 (23.3%) samples the amount of DNA extracted would have been insufficient for EGFR testing by RealTime PCR or pyrosequencing, and they would had been classified as "not adequate". We processed these cases by mass spectrometry observing EGFR and KRAS mutations in 12 (11.8%) and 30 (29.4%) cases, respectively. Among all cases we observed 12 (2.7%) tumours with neoplastic cell content lower than 30% that didn't revealed any mutation in EGFR/KRAS. We classified these patients as "inadequate for molecular testing", recommending a retest on a more representative sampling of the lesion.

Conclusions: Combining a sensitive multiplexed mass spectrometry approach with an efficient management of the sample, the diagnostic accuracy was 97.3%. This value would had been decreased to 76.7% if only Real Time or sequencing methods were available. Considering the generally mutual presence of EGFR/KRAS mutations and ALK rearrangements we avoid a further diagnostic bronchoscopic exam to 42 patients. Cooperation between pneumologist, pathologist, molecular biologist and oncologist is essential for the management of NSCLC patients.

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