Board of Education and Assessment Trainee Poster Prize

ROS1 REARRANGEMENTS ARE ONLY FOUND IN LUNG ADENOCARCINOMAS WITH DIFFUSE STRONG IHC EXPRESSION OF ROS1

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Background: *ROS1* gene rearrangements occur in 1–2% of lung adenocarcinomas and define a molecular subgroup susceptible to targeted tyrosine kinase inhibitors. Immunohistochemistry (IHC) for *ROS1* can be used to screen for *ROS1* rearrangements, but the specificity is not high and confirmation by a molecular method such as fluorescent *in situ* hybridisation (FISH) is required.

Methods: We reviewed lung adenocarcinomas tested for a *ROS1* rearrangement by FISH between 2017 and 2019, with the aim to highlight the IHC staining pattern and intensity most likely to correlate with a *ROS1* rearrangement. Only cases with evaluable *ROS1* IHC and FISH, and with no known *EGFR* or *ALK* alterations, were included.

Results: Of 123 cases included in the study, 24 (19.51%) were FISH positive and 99 (80.49%) were negative. The *ROS1* IHC was assessed for staining intensity (0, 1, 2, or 3+) and % positive cells to generate an H-score (intensity × %). The *ROS1* FISH positive cases had a median H-score of 300 (range 200–300; mean 290.83) and negative cases had a median H-score of 20 (range 0–300; mean 46.39).

Conclusions: Adenocarcinomas with a FISH-confirmed *ROS1* rearrangement demonstrate diffuse, strong (2–3+) IHC staining. Weak, patchy *ROS1* IHC staining is not associated with *ROS1* rearrangements.

VALIDATION OF PLASMA FREE HAEMOGLOBIN ANALYSIS USING H INDEX ON ROCHE COBAS C 701/702

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Introduction: Haemoglobin release from erythrocytes into plasma (plasma free haemoglobin or PfHb) may be due to *in vivo* or *ex vivo* haemolysis. Increased PfHb is associated with poor outcomes in patients receiving extracorporeal membrane oxygenation (ECMO) therapy.¹ PfHb monitoring is recommended in ECMO patients, with a threshold for investigation of 0.5 g/L.¹ We validated the Roche serum index gen 2 assay² for PfHb quantitation around 0.5 g/L.

Methods: Experimental samples were made from plasma spiked with haemolysate. Undiluted PfHb (50 g/L) was measured by

flow cytometry before dilution to 0.05–2.00 g/L. Bias and linearity were determined against the calculated PfHb in these diluted samples. Precision was determined by 30 repeat measurements over 6 days. Stability and interferences were assessed using standard definitions.³

Results: Cobas H index closely matched the calculated PfHb (Passing–Bablok regression fit: $y = x + 0.07$) and showed excellent precision (uncertainty of measurement = 4% when PfHb = 0.54 g/L). Samples were stable for 14 days at 4°C. Interference occurred with intravenous iron at therapeutic levels. Lipaemia, icterus, metronidazole and rifampicin interfered with measurement at high levels only.

Conclusion: Cobas H index quantifies PfHb accurately and precisely at concentrations relevant to monitoring ECMO patients.

References

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SENSITIVITY AND SPECIFICITY OF ALK IMMUNOHISTOCHEMISTRY IN THE IDENTIFICATION OF ALK GENE FUSIONS IN BONE AND SOFT TISSUE SARCOMAS OTHER THAN IN INFLAMMATORY MYOFIBROBLASTIC TUMOURS; EXPANDING THE SPECTRUM OF ALK GENE TRANSLOCATIONS

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Gene rearrangements in the anaplastic lymphoma kinase (ALK) gene have been documented in bone and soft tissue sarcomas other than inflammatory myofibroblastic tumours. Their identification provides potential therapeutic strategies using crizotinib, amongst other ALK inhibitors, which have proven efficacy in the advanced/metastatic setting.

Our aim was to explore ALK1 expression in mesenchymal tumours using immunohistochemistry on tissue microarrays (TMAs) and targeted RNA sequencing for confirmation of