

SPEAKER PRESENTATION

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# Pre-treatment ADC histogram-analysis at whole body diffusion-weighted MRI predicts disease free survival in ovarian cancer

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## Aim

To prospectively evaluate the predictive value of pre-treatment histogram analysis of apparent diffusion coefficients (ADC) at whole body diffusion-weighted imaging (WB-DWI/MRI) for patient outcome in primary ovarian cancers.

## Methods

Institutional review board approval and informed consent were obtained for this prospective study. Forty-four women diagnosed with FIGO stage III or IV ovarian carcinoma underwent 3-Tesla WB-DWI/MRI using 2 b-values ( $b=0-1000 \text{ s/mm}^2$ ), T2-weighted and contrast-enhanced T1-weighted sequences prior to treatment. The primary tumour was delineated using semi-automated software and was analysed by using an ADC histogram approach: mean and median ADC, standard deviation (SD), coefficient of variation (CoV,  $SD/mean$ ), kurtosis and skewness were calculated. Kaplan-Meier with log-rank statistics were used to correlate baseline ADC parameters to disease free survival (DFS). Effects of confounding patients- and tumour-related factors were taken into consideration using Cox proportional hazard model.

## Results

5 patients underwent primary- and 39 interval debulking surgery completing 6 cycles of platinum-based chemotherapy. Survival analyses showed that lower CoV was associated with significantly longer DFS (median  $\pm$  SD;  $19 \pm 2$  months for  $CoV < 0.2601$  versus  $12 \pm 1$  months for  $CoV > 0.2601$ ;  $p=0.002$ ). After multivariable analysis, CoV

remained an independent prognostic biomarker for DFS ( $p=0.003$ ) when taking patient's age, FIGO stage, tumour grade and cancer antigen (CA)-125 level into consideration as clinical prognostic factors.

## Conclusion

In this pilot study, pre-treatment ADC histogram analysis of primary ovarian cancer using the CoV was an independent predictive marker of DFS suggesting a correlation between tumour heterogeneity and treatment resistance. Further research should elucidate the correlation with overall survival.

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