Background:

- Metaiodobenzylguanidine (MIBG) scans are used to evaluate neuroblastoma (NB) stage at diagnosis and determine response to therapy.

- Previous efforts to predict response to therapy using semi-quantitative scoring of diagnostic MIBG scans from high-risk NB patients have been unsuccessful.

- We hypothesized that a convolutional neural network (CNN) could be trained on diagnostic MIBG scans from high-risk NB patients to predict response to induction chemotherapy.

Methods:

- MIBG scans from Children’s Oncology Group ANBL12P1 study were obtained via the International Neuroblastoma Risk Groups Data Commons.

- The CNN was trained using 2D whole body scans obtained at diagnosis.

- Hyperparameter optimization was performed using an 80%-20% train-validation strategy to establish AUROC model performance metrics.

Results/Graphs/Data:

Our study suggests it is feasible to apply machine learning to diagnostic MIBG scans from high-risk neuroblastoma patients to predict response to chemotherapy.

- Actionable diagnostic biomarkers may enable more informed treatment selection.

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Future Directions:

Additional efforts to improve performance using larger datasets are ongoing.