00414       **Textural Analysis of T2-weighted MR Images Can Distinguish Between High and Low Grade Pediatric Brain Tumors**

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**Aims:** Pediatric brain tumors are the most common childhood solid tumors and the second leading cause of cancer deaths in children. A new technique to characterize pediatric brain tumors is textural analysis. The aim of this study is to use textural analysis to distinguish between (1) high and low-grade pediatric brain tumors and (2) genotypic subgroups of medulloblastoma.

**Methodology:** Preoperative T2 weighted MRI images of 149 pediatric patients diagnosed histopathologically with brain tumors were retrieved from a public children's hospital in Singapore. The statistical filtration-histogram approach of textural analysis was performed using TexRAD. The textural features mean, standard deviation, entropy, mean of positive pixels, skewness and kurtosis were extracted and their diagnostic performances evaluated.

**Result:** For individual textural features, skewness at spatial scale filter (SSF) 0 (odds ratio (OR) = 3.22, area under curve (AUC) = 0.786, $p = 0.01$, sensitivity = 67.6% and specificity = 76.4%) best distinguished between high and low-grade brain tumors. The combination of SSF 0 mean, SSF 0 entropy, SSF 0 skewness, SSF 2 MPP, SSF 3 entropy, SSF 6 MPP and SSF 6 kurtosis (AUC = 0.888, $p = 0.05$, sensitivity = 84.0%, specificity = 80.9%) best distinguished between high and low-grade brain tumors. Textural analysis could not distinguish WNT, SHH, Group 3 and Group 4 genotypic subgroups of medulloblastoma completely from one another.

**Conclusion:** Textural analysis can distinguish between high and low-grade pediatric brain tumors reasonably well but is unable to completely distinguish between genotypic subgroups of medulloblastoma.