

Abstract Title Application of PWI in Predicting the Radiosensitivity of Nasopharyngeal Carcinoma

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BACKGROUND: Nasopharyngeal carcinoma (NPC) is the most common malignant tumor of head and neck in southern China and radiotherapy is the main treatment for it. The treatment effect of NPC gradually improved with the development and application of concurrent chemotherapy and radiotherapy but there are still some treatment failure because of radiation resistance and relapse in a short time. Hypoxia is well known to cancer radiation resistance and treatment failure. NPC is a vascular endothelium-dependent tumor. Perfusion-weighted Imaging (PWI) provides assessment of the hemodynamic information representing regional blood volume (vascular density) and flow, also it is useful in reflecting blood perfusion patterns and indirectly reflect the situation of tumor hypoxia and ischemia. PWI may be a useful tool for predicting radiosensitivity of NPC.

HYPOTHESIS: The parameters of PWI can be used as an indicator to predict radiosensitivity of NPC which also provides a reference for individualized treatment of nasopharyngeal carcinoma.

METHODS: 94 patients pathologically proved nasopharyngeal carcinoma during the period from December 2013 to December 2014 in our hospital underwent PWI before radiotherapy, after receiving 20 Gy dose and end of the treatment. According to the tumor regression rate after 3 months, the patients were divided into sensitive therapeutic effect group (CR group) and resistant therapeutic effect group (non-CR group). The data were analyzed by Functool to calculate transfer constant (K_{trans}), rate constant (K_{ep}), f_{pv} and leakage space (V_e). The tumor volume measured before radiotherapy, after receiving 20 Gy dose and end of the treatment, calculate tumor regression rate. The correlation between parameters of PWI and the tumor regression rate were studied.

RESULTS: The tumor regression rate had a positive correlation with the expression of V_e , while other PWI parameters had no significant correlations with it. ROC analysis showed that when the tumor regression rate $\geq 65.69\%$ predicting sensitive therapeutic effect, the specificity, sensitivity was 68.7%, 84.1% (AUC=0.819, p=0.000)