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Chemoradiation in Esophageal Cancer: Results of the Prospective Cologne  
Esophageal Response Prediction (CERP) Study**

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# Molecular Markers for the Prediction of Minor Response to Neoadjuvant Chemoradiation in Esophageal Cancer: Results of the Prospective Cologne Esophageal Response Prediction (CERP) Study

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## Abstract

**Objective:** The aim of this study was to evaluate the predictive value of a single or combination of biomarker(s) for histopathologic non-response to neoadjuvant chemoradiation in esophageal cancer.

**Summary of Background Data:** Patients without response to neoadjuvant chemoradiation for esophageal cancer have no prognostic benefits, but experience time delays and risk side effects.

**Methods:** Inclusion criteria for this prospective diagnostic study were patients with cT3,Nx,M0, esophageal squamous cell or adenocarcinoma and planned neoadjuvant chemoradiation (5- fluorouracil, cisplatin, 40Gy) followed by 2-field transthoracic esophagectomy. From pretherapeutic endoscopic tumor biopsies, ERCC1 rs11615 single-nucleotide polymorphism (ERCC1-SNP) and a combination of gene expression marker mRNA (ERCC1, DPYD, ERBB2) were analyzed. ERCC1-SNP was subdivided into homozygous C-allele (CC) and T-allele (TT), and heterozygous C/T carriers. The primary endpoint was the prediction of histopathological minor response ( $\geq 10\%$  vital tumor cells in the primary tumor) relative to marker levels.

**Results:** From 2009 until 2013, 320 patients were screened, and 85 patients (SCC n = 29, AC n = 56) were included in the study. Forty-one patients (48%) had major response with 3-year survival rate (3-YSR) of 57% compared with 44 patients with minor response and 3-YSR of 25% ( $P = 0.001$ ). Patients with ERCC1-SNP CC (n = 8) and TT (n = 37) had similar rates of minor response of 70% and 75%, and a positive predictive value (PPV) of 71% [95% confidence interval (CI) 56%–84%]. PPV increased to 89% (95% CI 73%–96%) when ERCC1-SNP was combined with mRNA markers.

**Conclusion:** ERCC1-SNP in combination with mRNA ERCC1, DPYD, and ERBB2 from pretherapeutic endoscopic biopsies can predict minor response to chemoradiation, as a basis for individualized therapy of advanced esophageal cancer.

## Author Information

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Prospective Diagnostic Study (NCT00628368).

The authors declare that they have nothing to disclose.

The authors report no conflicts of interest.

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