Association between radiation dose and pathological complete response after preoperative radiochemotherapy in esophageal squamous cell cancer.

This study was undertaken to examine the impact of radiation dose on pathological complete response (pCR) rates following neoadjuvant radiochemotherapy (N-RCT) for squamous cell esophageal cancer (ESCC). From 1988 to 2011, 218 patients were treated with 30-30.6 Gy (1.8-2 Gy per fraction), 39.6-40 Gy (1.8-2 Gy per fraction) or 44-45 Gy (1.8-2 Gy per fraction) and concomitant cisplatin ± 5-fluorouracil (5-FU), oxaliplatin + 5-FU or 5-FU alone. The most commonly used concomitant chemotherapy was continuous infusion of 5-FU-alone with a dose of 300 mg/m²/day during the whole course of treatment (n=111). To eliminate the dispersing effect of potentially different efficacy levels of these drug regimens on pCR, we excluded patients with regimens other than 5-FU-alone. Histomorphological regression grade 1a (0% residual tumor), 1b (50% residual tumor) was observed in 26 (23%), 24 (22%), 36 (32%) and 25 (23%) patients, respectively. pCR was observed in 9 out of 71 (13%) patients treated with 30 Gy-30.6 Gy, 13 of 34 (38%) patients treated with 39.6-40 Gy and 4 of 6 (67%) patients treated with 44-45 Gy (p=0.001). Median follow-up time from the start of N-RCT was 191 months (range=2-262 months). The estimated 5-year overall survival (OS) was 33% for the whole cohort. OS at 5
years was 58% for patients with pCR compared to 25% for patients with less favorable response to N-RCT (p=0.009), respectively. The dose of radiation correlates significantly with the likelihood of achieving a pCR in stage II/III squamous cell esophageal cancer patients. Prospective randomized trials are required to definitively evaluate the impact of application of higher radiation doses on efficacy and safety/tolerability in the context of N-RCT on the clinical outcomes.