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Oncologic benefits of neoadjuvant treatment versus upfront surgery in borderline resectable pancreatic cancer: A systematic review and meta-analysis

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Background : Neoadjuvant treatment (NAT) followed by surgery is the primary treatment for borderline resectable pancreatic cancer (BRPC). However, there is limited high-level evidence supporting the efficacy of NAT in BRPC.

Methods : PubMed was searched to identify studies that compared the survival between BRPC patients who underwent NAT and those who underwent upfront surgery (UFS). The overall survival (OS) was compared using intention-to-treat (ITT) analysis.

Results : A total of 1,204 publications were identified, and 19 publications with 21 datasets (2,906 patients; NAT, 1,516; UFS, 1,390) were analyzed. Two randomized controlled trials and two prospective studies were included. Thirteen studies performed an ITT analysis, while six presented the data of resected patients. The NAT group had significantly better OS than the UFS group in the ITT analyses (HR: 0.63, 95% CI = 0.53–0.76) and resected patients (HR: 0.68, 95% CI = 0.60–0.78). Patients treated with both neoadjuvant gemcitabine or S-1-based chemotherapy and neoadjuvant FOLFIRINOX showed improved OS in the ITT analysis (gemcitabine, HR: 0.66, 95% CI = 0.56–0.78, I2 = 41%; FOLFIRINOX, HR: 0.56, 95% CI = 0.29–1.06, I2 = 82%). The resection rate was higher in the UFS group in the ITT analysis. The R0 resection rate among the resected patients was significantly improved in the NAT group (OR: 4.16, 95% CI = 3.35–5.17, I2 = 48%). The lymph node positivity rate among the resected patients was relatively lower in the NAT group (OR: 0.26, 95% CI = 0.21–0.32; I2 = 68%).

Conclusions : NAT improved the OS, R0 resection rate, and node-negativity rate compared with UFS. Standardizing treatment regimens based on high-quality evidence is fundamental for developing an optimal protocol.

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