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Does Neoadjuvant Chemotherapy Improve Patient Outcomes In Patients With Resectable Pancreatic Ductal Adenocarcinoma: A Meta-analysis

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Background : Neoadjuvant chemotherapy (NAC) is being increasingly investigated for resectable pancreatic ductal adenocarcinoma (PDAC) due to the low completion rate of adjuvant therapies.

Methods : A systematic review of the literature was performed for studies assessing NAC with upfront surgery (UFS) in resectable PDAC between 2010 and 2022. The primary outcome was overall survival (OS) and secondary outcomes were progression-free survival (PFS) and R0 resection rate (R0 RR). Metaanalyses were performed using RevMan 5.4 software. The meta-analyses utilised intention-to-treat analysis comparing neoadjuvant chemotherapy with upfront surgery and was conveyed as hazard ratio for survival and odds ratio for R0 RR.

Results : OS was assessed in fourteen studies with NAC associated with increased OS (HR 0.80, 95% CI 0.76 - 0.85, p < 0.00001), with no significant heterogeneity (I2 = 17%, p = 0.27). PFS was reported in eight studies, with NAC associated with improved PFS (HR 0.78, 95% CI 0.64-0.95, p = 0.01). However, there was significant heterogeneity amongst these studies (I2 = 91%, p < 0.00001). There was no significant difference in R0 RR (OR 1.11, 95% CI 0.71 – 1.75, p = 0.64). In a subgroup of patients who received NAC and underwent pancreatectomy, the R0 RR was significantly improved compared with UFS (OR 1.77, 95% CI 1.29 – 2.43, p < 0.0004), with no significant heterogeneity in this analysis (I2 = 27%, p = 0.18).

Conclusions : This meta-analysis is the first to demonstrate an overall survival benefit for patients with resectable PDAC who receive NAC. Further well-powered trials are required to confirm this relationship.

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