# Efficacy and Safety of PD-1 Inhibitors in the Treatment of Advanced Pancreatic Cancer: A Systematic Review

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## ABSTRACT

**Introduction:** Pancreatic cancer is one of the most challenging cancers to treat, with limited effective options and a mortality rate of nearly 99% due to late-stage detection. Inhibitors of the PD-1 pathway have shown the highest specificity and efficacy among checkpoint inhibitors. This systematic review was conducted to evaluate the effectiveness and safety of PD-1 inhibitors in treating pancreatic cancer.

**Search Study:** We thoroughly searched Google Scholar, PubMed, Web of Science, and Scopus and identified 4129 records. After removing 407 duplicates, 3,722 titles and abstracts were examined, excluding 3260 records. Of the remaining 462 records, 376 were screened for full text. Finally, 10 studies were included in the study.

**Results:** Our systematic review identified and analyzed the efficacy and safety of PD-1 inhibitors in treating advanced pancreatic cancer. The quality of evidence for the included studies was reported as moderate in eight studies and high in two. PD-1 inhibitors, such as monotherapy, tend to provide moderate benefits, but when PD-1 inhibitors are combined with other treatments like chemotherapy or radiotherapy, the outcomes are generally better. PD-1 inhibitors showed promise in enhancing survival rates, mainly when used in combination therapies. Combining PD-1 inhibitors with treatments such as AG chemotherapy, stereotactic body radiation therapy, and optional chemotherapy improved clinical outcomes and reduced the risk of death. One study specifically highlighted a 20% decline in the risk of death when PD-1 inhibitors were used in combination with AG chemotherapy. These combinations showed increased survival rates, reduced tumor size, and enhanced immune responses, making them a more practical option for treating advanced cancers

**Conclusion and Discussion:** This systematic review summarizes the current evidence on the efficacy and safety of PD-1 inhibitors in treating advanced pancreatic cancer. PD-1 inhibitors are a promising treatment option for patients with advanced pancreatic cancer, mainly when used in combination with other therapies. It is recommended that more rigorous and controlled clinical trials be conducted to examine these hypotheses more closely. Conducting studies with a larger sample size and a more extended follow-up period is also recommended.

*Keywords:* Pancreatic neoplasms, Safety, Systematic review

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