THERAPEUTIC INNOVATION IN PANCREATIC CANCER: CLINICAL, ECONOMIC, AND HEALTHCARE IMPLICATIONS OF THE INTRODUCTION OF DARAXONRASIB INTO ONCOLOGY PRACTICE

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Abstract

Pancreatic cancer remains one of the malignancies with the poorest prognosis, characterized by high mortality rates and limited therapeutic options, particularly in advanced stages. In this context, this chapter aims to analyze the clinical, economic, and healthcare implications of introducing daraxonrasib into contemporary oncology practice. The methodology consisted of a narrative review of national and international scientific literature, including indexed articles, clinical studies, and technical documents published between 2020 and 2026, focusing on targeted therapies directed at KRAS gene mutations. The findings indicate that daraxonrasib represents an innovative therapeutic strategy by specifically targeting molecular alterations associated with tumor progression, contributing to improved survival outcomes, better disease control, and potentially fewer adverse effects when compared with conventional treatments. However, its incorporation into healthcare systems presents challenges related to high costs, the need for genomic testing, and the reorganization of specialized services to ensure equitable access for eligible

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patients. It is concluded that daraxonrasib has the potential to transform pancreatic cancer management, highlighting the importance of precision medicine and the continuous assessment of its clinical, economic, and healthcare impacts in modern oncology.

Keywords: Oncology, Pancreatic cancer, Precision medicine, Targeted therapy, Daraxonrasib.

INTRODUCTION

Pancreatic cancer represents one of the greatest challenges in contemporary oncology due to its high biological aggressiveness, frequently late diagnosis, and low long-term survival rates. According to the World Health Organization (2024), this neoplasm ranks among the leading causes of cancer mortality worldwide and is responsible for a significant clinical, social, and economic impact on healthcare systems. Most patients present with locally advanced or metastatic disease at the time of diagnosis, limiting curative therapeutic possibilities and contributing to unfavorable prognoses.

In recent decades, advances in the understanding of the molecular biology of pancreatic ductal adenocarcinoma have made it possible to identify genetic alterations associated with tumor progression, with particular emphasis on mutations in the KRAS gene, which are present in approximately 90% of cases of the disease (Mizrahi et al., 2020). This scenario has driven the development of targeted therapies capable of acting specifically on molecular mechanisms involved in pancreatic carcinogenesis, opening new perspectives for personalized treatment.

In this context, daraxonrasib emerges as a promising therapeutic innovation aimed at the selective blockade of oncogenic pathways related to KRAS mutations. Although preliminary results indicate potential clinical benefit in terms of tumor control and increased survival, its incorporation into healthcare practice raises questions related to effectiveness, safety, cost-effectiveness, and patient accessibility to new treatments (Moore et al., 2024).

Given this panorama, the research problem guiding this chapter consists of understanding the clinical, economic, and healthcare implications arising from the introduction of daraxonrasib into the

management of pancreatic cancer. This issue is relevant due to the increasing incorporation of high-cost technologies in oncology and the need to balance therapeutic innovation, the sustainability of healthcare systems, and expanded access to treatments.

The general objective of this study is to analyze the clinical, economic, and healthcare implications of the introduction of daraxonrasib into oncology practice for pancreatic cancer. Its specific objectives are to describe the main epidemiological and molecular aspects of the disease; discuss the mechanisms of action and clinical outcomes associated with daraxonrasib; and assess the challenges related to the incorporation of this technology into healthcare services.

The relevance of this topic is grounded in the need to expand knowledge about new therapeutic strategies directed at pancreatic cancer, contributing to evidence-based clinical decision-making and to the formulation of public policies that favor the rational use of innovative technologies. As highlighted by Neoptolemos et al. (2018), the advancement of precision medicine has the potential to significantly modify the prognosis of patients with tumors historically associated with high mortality rates.

From a theoretical perspective, this study is based on the concepts of precision oncology, targeted therapies, and health technology assessment, considering that the incorporation of new drugs requires an integrated analysis of clinical benefits, economic impacts, and organizational repercussions for healthcare systems (Porter; Teisberg, 2007; Drummond et al., 2015). Thus, the discussion of daraxonrasib goes beyond isolated therapeutic outcomes, encompassing aspects related to sustainability, equity, and the quality of oncological care.

METHODOLOGY

TYPE OF RESEARCH

This study is characterized as qualitative, descriptive, and exploratory research, developed through a narrative literature review. The choice of this approach is justified by the need to gather, analyze, and discuss scientific evidence related to the clinical, economic, and healthcare implications of the

introduction of daraxonrasib in the treatment of pancreatic cancer. According to Gil (2022), exploratory studies allow greater proximity to the investigated phenomenon, favoring the construction of knowledge on emerging topics that remain insufficiently consolidated in the literature.

SEARCH STRATEGY AND STUDY SELECTION

The bibliographic search was conducted in national and international databases widely recognized in the health field, including PubMed, Scopus, Web of Science, the Virtual Health Library (VHL), and the Scientific Electronic Library Online (SciELO). Descriptors related to the topic were used in Portuguese and English and combined with Boolean operators, such as: “câncer de pâncreas,” “pancreatic cancer,” “KRAS inhibitors,” “targeted therapy,” “precision oncology,” “daraxonrasib,” and “health technology assessment.”

Scientific articles, systematic reviews, clinical trials, institutional documents, and technical reports published between 2020 and 2026 were included, provided they were available in full and related to the clinical, economic, or healthcare aspects of targeted therapies directed at KRAS gene mutations. Duplicate studies, works without direct relevance to the topic, and publications without recognized scientific support were excluded.

INSTRUMENTS AND ANALYTICAL PROCEDURES

Data were collected through the critical and systematic reading of the selected studies. The extracted information was organized into previously defined thematic categories: clinical aspects of pancreatic cancer, mechanisms of action of daraxonrasib, economic impacts of technological incorporation, and healthcare repercussions for oncology services.

Data analysis was conducted descriptively and interpretively, enabling the identification of convergences, divergences, and gaps in the scientific literature. According to Marconi and Lakatos

(2021), documentary and bibliographic analysis makes it possible to understand complex phenomena through the integration of different sources of information.

STUDY SAMPLE

The sample consisted of scientific publications and technical documents selected according to the established inclusion criteria. Priority was given to studies of high methodological quality, especially clinical trials, systematic reviews, and international guidelines related to the treatment of pancreatic cancer and the development of targeted therapies for KRAS mutations.

The selection sought to include evidence from different healthcare contexts, enabling a comprehensive analysis of the potential benefits and challenges associated with the implementation of daraxonrasib in clinical practice.

ETHICAL ASPECTS

As this is a literature review based on secondary data in the public domain, submission to a Research Ethics Committee was not required, in accordance with the guidelines established by Resolution No. 510/2016 of the Brazilian National Health Council. Nevertheless, the principles of scientific integrity, methodological rigor, and appropriate citation of the consulted sources were respected.

METHODOLOGICAL DISCUSSION

The adoption of a narrative review proved appropriate for understanding a recent and constantly evolving topic, such as the use of daraxonrasib in precision oncology. Recent studies emphasize that the development of therapies directed at molecular alterations in the KRAS gene represents one of the main frontiers of therapeutic innovation in solid tumors, including pancreatic cancer (Mizrahi et al., 2020).

Moreover, the incorporation of new pharmacological technologies requires assessments that go beyond traditional clinical outcomes, encompassing economic, organizational, and social aspects. In this

regard, Drummond et al. (2015) emphasize that health technology assessment should consider not only the efficacy of treatments, but also their financial sustainability and impact on healthcare systems.

Thus, the methodology adopted made it possible to gather relevant evidence for a broad understanding of the topic, favoring a critical discussion of the benefits, limitations, and challenges related to the introduction of daraxonrasib into contemporary oncological care.

RESULTS AND DISCUSSION

The literature analysis showed that pancreatic cancer remains one of the most lethal neoplasms in the global oncological scenario. Despite advances in diagnosis and treatment, overall patient survival remains limited, especially in cases diagnosed at advanced stages. In this context, the development of targeted therapies directed at the tumor's molecular alterations has been identified as a promising strategy to improve clinical outcomes (Mizrahi et al., 2020).

Among the most recent therapeutic innovations, daraxonrasib emerges as an alternative aimed at blocking specific mutations in the KRAS gene, one of the most frequent genetic alterations in pancreatic adenocarcinoma. Preliminary clinical studies demonstrate favorable results regarding control of tumor progression and increased progression-free survival, reinforcing the potential of precision medicine in modern oncology (Moore et al., 2024).

Table 1

Main challenges of conventional treatment and potential contributions of daraxonrasib

Aspect	Conventional Treatment	Introduction of Daraxonrasib
Therapeutic specificity	Low	High
Control of tumor progression	Moderate	Potentially superior
Systemic toxicity	High	Lower in selected patients
Need for biomarkers	Limited	Essential
Treatment personalization	Restricted	Expanded
Survival potential	Limited	Promising

Source: Prepared by the author based on Mizrahi et al. (2020) and Moore et al. (2024).

The studies analyzed indicate that the main advantage of daraxonrasib is related to its ability to act directly on molecular pathways associated with tumor growth. Unlike conventional chemotherapy regimens, which have systemic action and lower selectivity, targeted therapies seek to affect specific mechanisms involved in carcinogenesis, reducing damage to healthy cells and enhancing the therapeutic response (Neoptolemos et al., 2018).

Another relevant aspect identified in the literature concerns the economic impact of incorporating this technology. Although the drug has the potential to reduce indirect costs related to hospitalizations, complications, and disease progression, its high initial cost represents a challenge for both public and private healthcare systems. As Drummond et al. (2015) point out, the adoption of innovative technologies must be accompanied by cost-effectiveness assessments capable of demonstrating clinical benefits consistent with the investments made.

Table 2

Implications of the introduction of daraxonrasib into oncology practice

Assessed Dimension	Main Impacts
Clinical	Greater therapeutic precision and potential increase in survival
Economic	Increased initial costs and need for cost-effectiveness assessment
Healthcare	Increased demand for molecular diagnosis
Organizational	Need for professional training and service adaptation
Social	Possibility of improving patients' quality of life

Source: Prepared by the author based on Drummond et al. (2015), Porter and Teisberg (2007), and Moore et al. (2024).

From the healthcare perspective, it was observed that the use of daraxonrasib requires significant changes in the organization of oncology services. The identification of eligible patients depends on the performance of advanced genomic tests, requiring adequate laboratory infrastructure and teams trained to interpret the results. This reality reinforces the need for integration among molecular diagnosis, clinical oncology, and health management, elements considered fundamental for the consolidation of personalized medicine (Porter; Teisberg, 2007).

Furthermore, the studies indicate that the expansion of targeted therapies may contribute to a shift in the healthcare paradigm for pancreatic cancer. Historically associated with unfavorable prognoses and few therapeutic options, this type of cancer is beginning to benefit from more individualized approaches, based on each patient's genetic characteristics. However, the effectiveness of this transformation will depend on expanded access to diagnostic and therapeutic technologies, especially in countries with healthcare systems marked by regional inequalities.

Table 3

Summary of the main findings identified in the literature

Category	Findings
Epidemiology	High mortality and late diagnosis
Molecular aspects	High frequency of KRAS gene mutations
Clinical benefits	Better tumor control and potential increase in survival
Economic challenges	High acquisition and implementation costs
Healthcare challenges	Need for genomic testing and service reorganization
Future perspectives	Expansion of precision medicine in oncological treatment

Source: Prepared by the author based on the studies analyzed.

The results demonstrate that daraxonrasib represents a relevant innovation for the treatment of pancreatic cancer, especially because of its ability to direct therapy toward the molecular characteristics of the disease. However, its incorporation requires strategic planning, economic evaluation, and strengthening of healthcare infrastructure to ensure that clinical benefits are effectively translated into gains for patients and healthcare systems. Thus, the findings corroborate recent literature by showing that precision medicine tends to occupy an increasingly central role in the future of oncology (Mizrahi et al., 2020; Moore et al., 2024).

CONCLUSION

The present study aimed to analyze the clinical, economic, and healthcare implications of the introduction of daraxonrasib into oncology practice for the treatment of pancreatic cancer. Considering the high mortality associated with this neoplasm and the limitations of conventional treatments, the study sought to understand how this therapeutic innovation may contribute to the advancement of oncological care and to the consolidation of precision medicine.

The results obtained showed that daraxonrasib represents a promising strategy in the management of pancreatic cancer by acting in a targeted manner on specific molecular alterations, especially those related to the KRAS gene. The literature analyzed indicates potential for improved tumor control,

increased progression-free survival, and greater treatment personalization when compared with traditional therapeutic approaches. In addition, it was observed that the use of targeted therapies may favor the reduction of certain adverse effects resulting from conventional chemotherapy, contributing to better quality of life for patients.

On the other hand, the study also demonstrated that the incorporation of daraxonrasib into healthcare systems involves important challenges. These include the high costs associated with the drug, the need to perform genomic tests to identify eligible patients, and the demand for technological infrastructure and specialized human resources. Such factors reinforce the importance of continuous cost-effectiveness assessments and strategic planning to ensure equitable access to therapeutic innovations.

As a contribution, this research broadens the discussion on the multidimensional impacts of new targeted therapies in the context of pancreatic cancer, bringing together scientific evidence that may support clinical, managerial, and policy decisions related to the incorporation of technologies in oncology. The study also highlights the relevance of integrating scientific advances, healthcare system sustainability, and the qualification of care provided to oncology patients.

Finally, it is suggested that future research monitors the results of ongoing clinical studies on daraxonrasib, especially those focused on the assessment of overall survival, quality of life, long-term safety, and cost-effectiveness in different healthcare contexts. Investigations addressing the implementation of this technology in public healthcare systems may also contribute to the development of strategies capable of expanding patient access to the benefits of precision medicine. Thus, it is expected that the advancement of targeted therapies will continue to promote significant transformations in the treatment of pancreatic cancer and in contemporary oncology practice.

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