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Evaluation of the Cost-effectiveness and Cost-utility of Palbociclib Compared to Ribociclib in Women with Stage IV Breast Cancer: An Analysis Using Real-world Data

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Introduction

The evaluation of the cost-effectiveness and cost-utility of Palbociclib and Ribociclib in the treatment of women with stage IV breast cancer, using real-world data, is crucial in understanding the value these treatments provide within a clinical and economic context. Stage IV breast cancer, also known as metastatic breast cancer, presents one of the most significant challenges in oncology due to its advanced progression and the complexity of treatment options. In recent years, targeted therapies such as Palbociclib and Ribociclib, both of which are cycling-dependent kinase inhibitors, have been introduced as promising options for treating HR-positive, HER2-negative metastatic breast cancer. These therapies, however, come with high costs, raising questions about their value in terms of both clinical outcomes and economic implications [1].

Palbociclib and Ribociclib work by inhibiting CDK4/6, which are crucial regulators of the cell cycle. Inhibition of these kinases prevents cancer cell proliferation, making these drugs effective in treating metastatic breast cancer. Both drugs are used in combination with aromatase inhibitors, which suppress estrogen production, another key driver of HR-positive breast cancer. Despite their clinical efficacy, both drugs are expensive, and their economic value needs to be assessed, particularly in the context of real-world data, which can provide more insight into how these treatments perform outside of the controlled environment of clinical trials.

Description

Real-world data, as opposed to data from randomized controlled trials, reflects the treatment patterns, outcomes, and costs observed in routine clinical practice. These data are valuable because they consider a broader population, including patients who may have comorbidities or other factors that are often excluded from clinical trials. The use of real-world data in economic evaluations allows for a more accurate assessment of the cost-effectiveness and cost-utility of a treatment, as it accounts for factors such as drug access, adherence, and long-term outcomes that are often difficult to replicate in clinical trial settings. The cost-effectiveness of Palbociclib and Ribociclib in real-world settings hinges on several factors, including the drugs' ability to extend progression-free survival, the quality of life improvements they offer, and their associated costs. Both drugs have shown efficacy in clinical trials, but their real-world effectiveness may vary depending on patient population characteristics, such as age, comorbidities, and previous treatments. Additionally, the cost of these treatments is a significant factor in their economic evaluation. The price of Palbociclib and Ribociclib varies by region and health system, with both drugs being considerably expensive. In high-income countries, the cost of treatment can reach tens of thousands of dollars per year per patient, making it essential to consider whether the clinical benefits justify this cost [2].

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Cost-utility analysis is one of the most commonly used methods to assess the economic value of healthcare interventions. CUA involves calculating the incremental cost per quality-adjusted life year gained by the treatment. A QALY is a measure that combines both the quantity and the quality of life. It allows for a comparison of treatments based on their ability to extend life while maintaining or improving quality of life. For a treatment to be considered cost-effective, it generally needs to offer a good balance between its cost and the number of QALYs it provides. In the case of Palbociclib and Ribociclib, both drugs have shown potential in improving overall survival and progression-free survival, but their cost-effectiveness can only be determined by evaluating how much these benefits outweigh the costs.

One important consideration in evaluating the cost-effectiveness of Palbociclib and Ribociclib is their relative performance. While both drugs are in the same class of CDK inhibitors and share similar mechanisms of action, they have slight differences in their clinical profiles. Palbociclib has been available for a longer period and has more established real-world data, while Ribociclib, which was approved later, may still have limited data in certain populations. Therefore, a direct comparison of the cost-effectiveness of these two drugs must take into account differences in clinical outcomes, adverse event profiles, and patient populations. Real-world evidence might reveal variations in how each drug is used in practice, how patients respond to treatment, and the overall treatment costs, all of which are critical in determining their economic value. Another factor influencing the cost-effectiveness evaluation is the potential for drug access and adherence issues. In clinical practice, patients often face challenges related to drug coverage, out-of-pocket costs, and the ability to adhere to long-term treatment regimens [3].These factors can influence both the effectiveness and the overall cost of treatment, as poor adherence can lead to suboptimal outcomes and potentially higher costs due to the need for additional treatments or hospitalizations. Real-world data allows for a better understanding of these challenges, providing a more comprehensive assessment of the true economic burden of using Palbociclib or Ribociclib in routine care. Additionally, the economic evaluation must consider the broader healthcare system perspective, including the impact of treatment on healthcare resource utilization [4]. This includes costs associated with hospitalizations, physician visits, diagnostic tests, and managing side effects or complications from treatment. In the case of both Palbociclib and Ribociclib, side effects such as neutropenia, liver enzyme abnormalities, and fatigue can lead to additional healthcare costs. These costs must be factored into any comprehensive cost-effectiveness analysis to ensure that the true financial burden of treatment is accurately assessed [5].

Conclusion

Evaluating the cost-effectiveness and cost-utility of Palbociclib and Ribociclib in the treatment of women with stage IV breast cancer, using real-world data, is a vital exercise in determining the value these therapies offer. While both drugs demonstrate efficacy in improving clinical outcomes such as progression-free survival, their high costs necessitate a thorough analysis to assess whether their benefits justify the expenditure. Real-world data, which includes a more diverse patient population and reflects everyday clinical practice, is essential for making informed decisions about the adoption of these therapies. By examining both the clinical outcomes and the economic implications, healthcare providers and policymakers can make more informed decisions about the best ways to allocate resources and provide optimal care for patients with stage IV breast cancer.

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Conflict of Interest

None.

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