

Fresh Perspective on Costs of the Glucagon-Like-Peptide-1 Relative to Anti-Cancer Drugs

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ABSTRACT

Abbreviations: ad/met-NSCLC: Advanced/ Metastatic Non-small-cell Lung Cancer; EGFR: Epidermal Growth Factor Receptor; GLP-1: Glucagon-Like-Peptide-1; ICI: Immune Monoclonal Antibodies; Pembro: Pembrolizumab; PD-1: Programmed Cell Death Protein-1; TT: Targeted Therapy; US: United States

INTRODUCTION

Patients fear hearing news of the dreadful cancer diagnosis. Cancer incidence has increased along the years. Lung cancer is the most fatal of all throughout the universe. Air pollution, smoking, pesticides added to genetics are all culprits. Cancer is an equal opportunity employer, affecting millions across the globe. One out of five children will not survive 5 years. One out of eight women develop breast cancer. All men are prone to prostate cancer with blacks more susceptible. Cancer patients go into wide swings of despair and depression alternating with flashes of hope and recovery. There have been many successful and hopeful strides against cancer. The introduction of antibody drug conjugates and bispecific give us a glimpse of hope to keep winning the cancer war. Other serious and chronic diseases including heart, land diabetes mellites do not provoke the same fear as cancer.

Over the last 10 years, 3-drug classes emerged as breakthrough development in the therapy paradigm. The immune monoclonal antibodies (ICI) and targeted therapy (TT) are widely used in the treatment of advanced/ metastatic non-small-cell lung cancer (ad/met NSCLC) and other cancers. Proper Identification of genomic marker aberrations is crucial in the choice of therapy. The glucagon-like-peptide-1 (GLP-1) Semaglutide and Liraglutide, the newest class, were approved agonists in 2021 for the treatment of diabetes type 2 as well as obesity with their well-known serious cardiovascular and kidney complications. The effectiveness, safety and value of the 3 drug classes have been consistently and universally affirmed.

In the United States (US) an estimated 37.5 million people have adult-onset diabetes mellitus. The government fixed insulin monthly price at \$35. Only 5-10% have insulin-

dependent- diabetes in which the GLP-1 have no value and should not be used. The current consumer system is presently focused on cost of one to few times drug purchases, overlooking the high price tag of the whole treatment course. Costs were reported as proportional to duration of therapy [1,2].

The monthly US cost of Semaglutide tablet without insurance ranges from \$1,000 - \$1,200. At \$1,100 yearly cost, the 5-10-year were \$5,500 - \$11,000. The tablets come in 3 dosage 3,7 and 14 mg, all at the same price. Some US dealers break the 14-mg tablets in 4 portions to make profits. The 28-day injection cost was \$1,349 or \$16,188 per year (Table 1).

Table 1. Cost of The Glucagon-Like-Peptide-1 Semaglutide.

Semaglutide	1-year cost	3-year cost	10-year cost
Oral 14mg	\$1,100	\$3,300	\$11,000
Injectable, 0.5 -2 mg sc q week	\$1,618	\$4,854	\$16,180

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The ICI were introduced approximately 10 years ago, with Pembrolizumab (Pembro) [3-5] being the 1st reported in treatment of ad/met NSCLC with programmed cell death protein 1 (PD-1) > 50%. The estimated cost per patient per year was \$150,000. Nivolumab, Durvalumab and Cemiplimab soon followed at essentially comparable costs. In view of the documented overall survival, the 2-year \$300,000 cost was equitable and justified. The ICI 3-year use was unwarranted due to lack of further survival improvement. Pembro would soon lose its patency, and the

company apparently plans to introduce a subcutaneous formulation. The addition of low-cost chemo-drugs to ICI has obviated the 50% PD-1 requirement.

The 1st TT introduced was Osimertinib, an epidermal growth factor receptor inhibitor (EGFR). It is currently used as adjuvant, neoadjuvant and in a/m NSCLC treatment [6,7]. At an annual median cost of \$230,000, the 3-years were \$690,000. With therapy continued, the 10-year TT cost would mount to \$2,300,000 (Table 2).

Table 2. Costs of ICI and TT.

Drugs	2-year cost	3-year cost	10-year cost
ICI in PD-1>50%	\$300,000	Unwarranted	
ICI + Chemo	\$302,000	Unwarranted	
TT	\$460,000	\$690,000	\$2,300,000
TT + 2-tests	\$464,000	\$694,000	

Cost counts [8,9] and accountability matter more. The growing financial burden from high cost targeted oral anticancer medicines among Medicare beneficiaries with cancer has been clearly delineate [10,11]. High drug costs limit not only the 1st but also subsequent purchasing. Wise stewardship demands vigorous cost counting with strict accounting. Cost of drugs is a worthy cause to seriously consider and faithfully pursue. The Cost doctrine is based on proportionality to the number of purchases [1,2]. Semaglutide represents a novel class widely used in the treatment of diabetes mellitus and obesity with a lot of potential still to climb. Effective treatment could eventually reduce cardiovascular mortality. Semaglutide cost is currently more expensive in the US than in Europe. The Canadian government has recently passed a law dispensing diabetes medications free from charge.

In summary, due to the universal prevalence of diabetes mellitus and obesity, proven effectiveness and wide utilization of Semaglutide, pharma might consider voluntarily reducing its costs, especially in the US, without sustaining any financial loss. In ad/met NSCLC, the ICI 2-year costs are justifiable. Continuing TT beyond 3-years is too expensive to bear and deserves closer scrutiny. The antibody drug conjugates and bispecific are glimpse of hope to win the war against cancer.

CONFLICT OF INTERESTS

The authors declare that there are no conflicts of interest.

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