A Descriptive Study of Immune Checkpoint Inhibitors in the Home Infusion Setting

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Introduction / Background

Immune checkpoint inhibitors (ICIs) work by blocking immune checkpoint pathways, thus promoting immune mediated tumor cell lysis. Pembrolizumab (Keytruda®), nivolumab (Opdivo®), and ipilimumab (Yervoy®) are among some of the PD-1 and CTLA-4 ligand receptor blockers indicated for the treatment of high risk, persistent, or metastatic cancers.

ICIs are advantageous in their versatility, high potency, and greater survival time and clinical efficacy among patients.[1] However, they are associated with several adverse reactions, including immune-mediated and hypersensitivity reactions.

In comparison to traditional chemotherapy, ICIs exhibit variable onset and prolonged duration.[2] PD-1 inhibitors such as pembrolizumab and nivolumab display local T-cell modulation on tumor cells and inflammatory tissue, translating to decreased toxicological effects. Conversely, CTLA-4 inhibitors such as ipilimumab exhibit a more widespread T cell activation in the lymph nodes, leading to higher rates of toxicity.[3] Because of the myriad oncologic indications, administration versatility, and adverse event profile, collecting baseline data may aid in developing the framework for standardized care plans that will solidify ICIs as a safe and accessible home infusion therapy.

Purpose / Objective

This descriptive study will review and compare pembrolizumab, nivolumab, and ipilimumab based on patient baseline characteristics, diagnosis, therapy type, care delivery, and adverse events reported.

Original Research Study Methods

This was a retrospective study utilizing electronic medical records between January 1, 2020 and September 30, 2022. Data collection included baseline characteristics, diagnosis, therapy type, reasons for discharge, and adverse events reported. Data is reported in terms of frequency and percent.

Results

Data was collected and analyzed from 42 patients across 21 sites who received ICI therapy *(Table 1)*. ICIs were dispensed evenly between male and female and most commonly between the ages of 51-60. Sixty-two percent of patients received doses in the home vs 38% in an alternate infusion site.

Melanoma and lung neoplasms were the most common diagnoses [n=11 (26%), n=6 (14%)] respectively *(Figure 1)*. Pembrolizumab was most commonly dispensed (n=19, 45%), followed by nivolumab at varying doses and durations (n=18, 43%). Three patients received nivolumab and ipilimumab concomitantly (7%), one patient received pembrolizumab and paclitaxel (2%), and one patient received pembrolizumab for 10 months and switched to nivolumab therapy (2%).

As seen in Figure 2, the most common reason for discharge was switching providers (n=13, 37.1%). Seven patients completed their course of ICIs (20%), and three patients switched to an alternate chemotherapy (8.6%). Eight patients are receiving ongoing therapy (19%).

Table 1 - Summary of Demographic Information

Gender (n=42)	
Male	22 (52.3%)
Female	20 (47.6%)
Age Range	
20-30	1 (2.4%)
31-40	4 (9.5%)
41-50	4 (9.5%)
51-60	14 (33.3%)
61-70	13 (30.9%)
71-80	5 (11.9%)
81-90	1 (2.4%)

Figure 1 - Therapy Type n=42

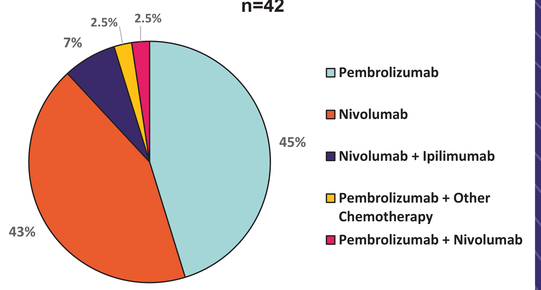


Figure 2 - Reasons for Discharge n=35

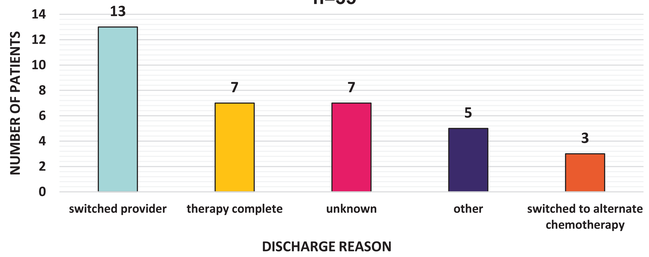
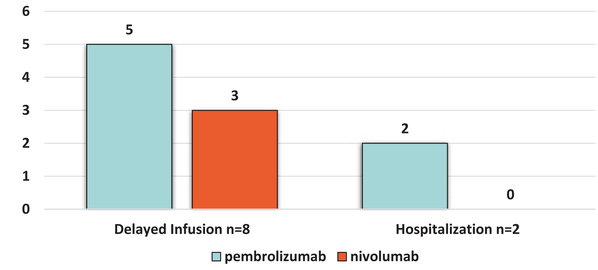


Figure 3 - Delayed Infusions vs Hospitalizations among ICI Therapies



Results *(continued)*

Two patients were hospitalized (4.7%) and eight patients experienced delayed infusions (19%). Of the eight delayed infusions, five patients received pembrolizumab (62.5%). Both hospitalized patients received pembrolizumab alone and were hospitalized for reasons unrelated to therapy. Of the 42 patients, 15 were dispensed anaphylaxis kits, and 5 were given pre-medications. There were no reports of hypersensitivity reactions or anaphylaxis kit use *(Figure 3)*.

Discussion

Monotherapy was more common than dual therapy with another traditional chemotherapy or another ICI. There was a higher rate of therapy delays and hospitalizations in the pembrolizumab group. Most patients experienced delays unrelated to adverse reactions, and no hospitalizations were related to therapy.

Potential limitations of this study are reliance on manual documentation and small sample size. Patients were managed closely by their oncology provider; therefore, documentation of long-term side effects may not have been received.

Conclusion

ICIs are a novel and adaptable oncologic therapy. This data provides baseline information on the use of these agents in the home infusion setting. There were no major safety events in this study.

References

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Disclosures

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation: Vahini Sundararaman; Christopher Roy; Maria Giannakos; Alex Pitsakis. Nothing to disclose.