Introduction

Objectives: Ig therapy is often described as rare, and although these diseases are clinically described in the medical literature, there are few comprehensive and well-characterized studies available of the patient with primary immune deficiency and/or immune-mediated neurological disorders. In addition, there is increasing recognition that the availability of clinical trial data, collected by highly specialized research settings, does not necessarily translate into improved patient outcomes in real-world clinical settings. The Immunoglobulin Diagnosis, Evaluation, and key Learnings (IDEaL) Patient Registry Program collects longitudinal information on patients receiving Ig replacement therapy from Coram Specialty/Institute Services in an alternate care setting. The goal of the IDEaL Patient Registry is to examine data from real-world patients on Ig therapy, including information related to diagnosis, dosing, and therapy tolerance. This data is analyzed to look at trends in patient demographics, as well as therapy and outcomes. Here we review registry results for primary immune deficiency (PID) patients from 18 months of data collection.

Methods

The study had 190 participating investigators across the US. Patients eligible to participate were those requiring Ig therapy who were referred by the participating physicians. Prospective patients were consented either in the physician offices or on an ad-hoc or by Registry staff. Once patients were enrolled, patient treatment information from July 2010 onward was made available for entry into the Registry database. Patient information included initial referral documentation, nurse visit records for infusions, and pharmacist follow-up progress reports. Additionally, every six months, an SF-36 and Quality Index Questionnaire (QIQ) was mailed to the patients to track their perceptions of their physical and mental health.

Results

Patient Demographics

Figure 1 shows the distribution of enrolled patients by their SF-36 diagnosis. The most common diagnosis in the Registry overall, as well as in our PID patients specifically, was common variable immunodeficiency (CVID, 27%)

Figure 2A shows the breakdown of the adult and pediatric patients by gender and age in the adult population, we see more women than men enrolled, but the gender split is much more even in the pediatric population. We also assessed patient age in 12-year age categories, our population averaged a protective titers to approximately four serotypes, and 75% of our population responded to half or fewer of the serotypes (see Figure 5).

Infection/Incidence

The annual rate of infection for all patients, regardless of route of administration, was three infections per year. We plotted average dose and annual number of infections on a scatter plot to assess dose responses. Figure 6 shows the plot for IgG patients, and Figure 6B for SCIg patients. As expected, there is a larger cluster of doses near the average, but within that there is variability evident in the average annual number of infections. Additionally, there is a number of patients with low doses and below average numbers of infections, and high doses and above-average infection rates. Further analysis of these patients may help isolate baseline characteristics that can be used to optimize dosing across a disease state.

Quality of Life Metrics

As part of the IDEaL data collection process, we plan an SF-36 survey and QOL (2) to the patients every 6 months, starting within 30 days of receiving a signed consent. Our results suggest that patients are generally happy with their infusions, and that they feel they are worthwhile. In the QIQ, the score range is from 1–7, with 7 being the most positive. Across all time points, the average patient QIQ total was approximately 57 out of 100 (57% of maximum). According to our data, patients had a sum positive experience with the infusions (see Figure 4C). Scores for both the infusions and the QIQ showed a high degree of positive viewpoints across all time points as well. However, patients had a more neutral to negative regard for the experience of the treatment across all time points. This reflects an almost equal distribution between those who felt the infusions were not expensive, and those who felt they were too expensive (see Figures 8E, C, and D).

Quality of Life Metrics—Change

SF-36 scores showed that patients initially reported a significantly lower Physical Component Score (PCS) as compared to the normalized population (51% versus 50.5, P<0.001). At 18 months, some of the initial variation showed a small but non-significant improvement from baseline (49.6, P<0.29). Patient Mental Component Scores (MCS) were higher, and were not significantly different from norm across all time points (see Figure 7A and B). Patients’ reasons for discharge were characterized and split between insurance-initiated, patient-initiated, or physician-initiated. The majority of patients tested for pneumococcal response, 75% of patients showed a blunted response to half or more of the tested serotypes. Most patients tested for pneumococcal response, 75% of patients showed a blunted response to half or more of the tested serotypes.

Conclusions

The IDEaL Patient Registry is designed to collect and analyze data from patients receiving Ig therapy in a real-world setting. Our findings showed that:

• There are significantly more adult females enrolled than adult males, however, in the pediatric population, the gender split is much more even, with males slightly outnumbering females. This trend suggests that male patients, as a group, have a higher rate of undiagnosed PID compared to female patients. Regardless of gender, our data suggests that as patients are not diagnosed in most childhood, they typically do not get diagnosed until much later in life (average age 9 years versus 51).

• The majority of our enrolled PID patients were diagnosed with common variable immunodeficiency (CVID—27%).

• Patients with reference values shown to be elevated picked up 62% of titers. A significant minority of patients included showed only suboptimal responses.

• Of patients tested for pneumococcal response, 75% of patients showed a blunted response to half or more of the tested serotypes.

• Patients on SCIG averaged 51 mg/kg administered weekly (344 mg/kg monthly), while IVIg patients averaged 473 mg/kg administered monthly. Patients switched from IVIg to SCIg had a conversion ratio of 1.17, below a manufacturer-recommended dose conversion of 1.3.

• Patients averaged three infections per year while on Ig treatment, regardless of route of administration. Analysis of patients showed a weak association between dose and infections, but it is more due to dose ranges being confined to a narrow range around the average. Further analysis of outliers from the analysis may be useful in isolating baseline variables that affect outcomes, independent of dose.

• Most patients tested of lime-lated discharges were mostly due to patients decreasing while on service, or feeling that their health had not improved on treatment. Physician initiated discharges were due mostly to patients having a reaction to treatment, or feeling that treatment was complete at the time.

Data from our ongoing analysis shows that long-term patients continue to report health improvement while on Ig therapy. We continue to see patients in this population with doses on the lower end of the recommended range, but breakthrough infections are still below reported untreated averages. The IDEaL Patient Registry continues to collect and analyze long-term data.

The Immunoglobulin Diagnosis, Evaluation, and key Learnings (IDEaL) Patient Registry: Analysis of Ig Dosing, Infection Control, and Quality-of-Life Assessments in Our Primary Immunodeficiency Population

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