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Poster # 122

Real-World Outcomes with Subcutaneous Immunoglobulin 16.5% in the Treatment of Primary Immunodeficiency

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Background

Immune globulin subcutaneous (IGSC) 16.5% solution is indicated to treat primary humoral immunodeficiency (PI) in adults and pediatric patients aged 2 years and older [1-3]. In contrast to immune globulin intravenous (IGIV) treatment, IGSC therapy leads to reduced occurrences of systemic adverse reactions and a more consistent pharmacokinetic profile among patients with PI [4]. Studies have demonstrated improved outcomes with IG therapy in relation to serious infections, hospitalizations, antibiotic use, missed work and school absences [4,5]. Previous studies have also reported favorable health-related quality of life (QoL) outcomes in patients transitioning from IGIV to IGSC using the Life Quality Index (LQI) [6,7].

IGSC therapy provided through a physician office infusion center (POIC) with nursing and pharmacy services has shown positive safety, efficacy, and tolerability in addition to high medication adherence [8]. A previous study reported 57 patients who received 52 weekly infusions of IGSC 16.5% [9]. Building upon these findings, the aim of this study was to expand our outcomes assessment to a larger patient population and evaluate the impact on health-related QoL.

Objectives

The objective of this study is to evaluate effectiveness, safety, and tolerability of IGSC 16.5% in 100 patients with PI receiving up to one year of therapy. Quality of life was assessed in IG-experienced patients transitioning to IGSC 16.5%.

Methods

A retrospective, observational study of 100 adult patients with PI who received IGSC 16.5% from June 2019 to September 2021 was conducted. Patients were eligible if they had a diagnosis of PI and had initiated IGSC 16.5% treatment at infectious disease or immunology POICs. Patients who were naïve to any immune globulin (IG) therapy, as well as those who previously utilized IGIV or IGSC therapies, were included in the study. Treatment initiation and training occurred at the POICs.

Patient initiation was conducted by IGSC-trained pharmacists and nurses providing training in self-administration and therapy management. Pharmacists dispensed the medication, devices and supplies, typically on a monthly basis and performed monthly assessments to capture patient-reported outcomes.

Primary endpoints were:

- Efficacy, defined by rate of serious bacterial respiratory tract infections (SBIs) per person-year, along with rates of all bacterial respiratory tract infections (RTIs)
- Safety, defined as systemic adverse events (AEs)
- Tolerability of treatment, defined as local infusion site reactions (ISRs)

- Other data included:
  - Baseline demographics and disease characteristics
  - IGSC 16.5% therapy details
  - Treatment adherence (e.g., utilization within ±2 days of scheduled treatment)

The validated Life Quality Index (LQI) was used to evaluate QoL and treatment satisfaction in IG-experienced patients transitioning to IGSC 16.5%. The questionnaire was administered by the pharmacists to eligible patients who agreed to participate. This survey was administered at baseline and 3, 6 and 12 months using three of the four LQI survey domains. The survey domains utilized were: (I) treatment interference, (II) therapy-related problems, and (III) therapy setting. The cost domain was not included. Scores were based on a 7-point Likert scale, with 7 representing “extremely good” scaling to 1 representing “extremely bad”. Each question was summed and converted to a traditional 0-100 scale.

Descriptive statistics included means, standard deviations (SD), medians, interquartile ranges (IQR), frequencies, and percentages. Jonckee-Terpstra test was used for trends of QoL over time ant t-test for differences between transitions to IGSC 16.5% from IGIV and alternative IGSC, both by questionnaire domain.

Results

Study Cohort

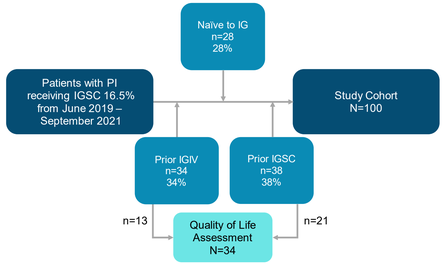


Table 1. Baseline Demographics and Disease Characteristics

Parameter	IGSC 16.5% N=100
Age in years, median (min, max)	53 (19, 76)
Female gender, n (%)	82 (82%)
Body weight in kg, median (min, max)	77.1 (41.3, 200.7)
Body mass index in kg/m^2, median (min, max)	27.5 (15.4, 55.3)
PI primary diagnosis, n (%)	
Common variable immunodeficiency (CVID)	62 (62%)
Selective deficiency of IgG subclasses	18 (18%)
Nonfamilial hypogammaglobulinemia	13(13%)
Other*	7 (7%)

*Antibody deficiency with near-normal immunoglobulins or hyperimmunoglobulinemia (n=6) and hereditary hypogammaglobulinemia (n=1).

Utilization

- A total of 100 patients were initiated with PI initiated IGSC 16.5% of which 62 patients completed 52 weeks of therapy.

Table 2. IGSC 16.5% Dosing and Administration

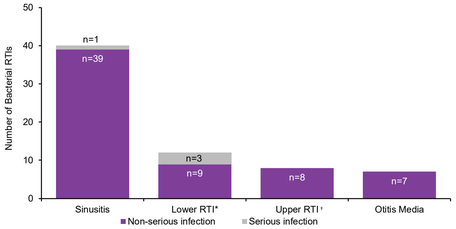
Parameter	IGSC 16.5% N=100
IGSC 16.5% Doses	**median (min, max)**
Weekly dose (mg/kg)	129.8 (75.7, 293.7)
Monthly dose (mg/kg)	519.4 (220.4, 1174.7)
IGSC 16.5% Infusions	
Total infusions	4,107
IGSC 16.5% Administration	**median (min, max)**
Initial rate per infusion site (mL/hr)	7.9 (4.2, 26.7)
Initial rate per all infusion sites (mL/hr)	23.6 (16, 80)
Initial volume per infusion site (mL)	20 (12,54)
Maximum rate per all infusion sites (mL/hr)	60.8 (22.1, 93.5)
Maximum volume per infusion site (mL)	20 (13.3, 54.0)
Number of infusion sites	3 (2, 6)

- Mean conversion faction from IGIV to IGSC was 1.2±0.2.
- 38 discontinued for various reasons: payor issues (n=14), patient preference (n=11), adverse events (n=4) financial (n=3), other (n=6).

Efficacy

- Efficacy was measured by the rate of serious bacterial infections
  - Rate of SBIs was 0.05 per person-year
  - Four serious bacterial infections occurred: pneumonia (n=3) and sepsis (n=1)
  - Rate of non-serious bacterial RTI's per person-year was 0.79.

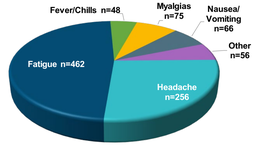
Figure 1. Overall Bacterial RTIs



*Lower RTI includes pneumonia (n=9), bronchitis (n=2), bronchiectasis (n=1).
†Upper RTI includes pharyngitis (n=2), unspecified upper RTI (n=6).

Safety

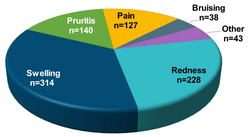
Figure 2. IGSC 16.5% Systemic AEs



- Systemic AEs reactions occurred in 56% of patients and in 17% of infusions, with fatigue most common.
- The rate of systemic adverse events per infusion was 0.23 (963 of 4107).

Tolerability

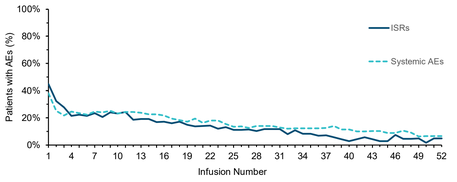
Figure 3. IGSC 16.5% Local Infusion Site Reactions



- ISRs occurred in 69% of patients and 14.2% of infusions overall. Swelling was most common.
- The rate of local infusion site reaction per infusion was 0.21 (890 of 4107)

Overall Tolerability

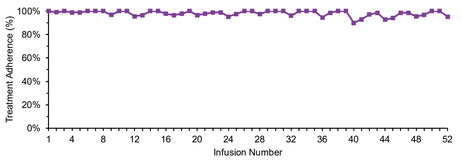
Figure 4. IGSC 16.5% Incidence of AEs Over Time



- Both the incidence of systemic AEs and infusion site reactions (ISR) decreased significantly over time (P<0.05).

Adherence

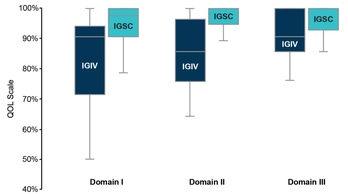
Figure 5. IGSC 16.5% Treatment Adherence, Through 52 Weeks



- Overall treatment adherence was 98.1% with 4,092 of 4170 infusions administered within ±2 days of scheduled dose.

Quality of Life

Figure 6. QoL Baseline Scores by Domain and Therapy Type Prior to IGSC 16.5%

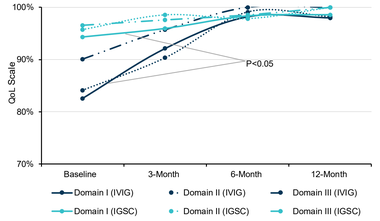


Domain I=Treatment interference, Domain II= Therapy-related problems, and Domain III = Therapy setting

- Before transitioning to IGSC 16.5%, patients exhibited lower QoL scores across all domains. At baseline, patients previously receiving IGIV had a wider range of QoL scores than those on alternative IGSC products.

Quality of Life, cont.

Figure 7. QoL Score Change Over Time by Domain and Therapy Type



- Overall, QoL improved over time in all domains.
- Patients previously receiving IGIV had a significantly greater improvement in Domain I (Treatment Interference) scores than in those previously on IGSC (P<0.05).

Discussion and Conclusion

We present outcomes of IGSC 16.5% through 12 months of treatment in a real-world clinical setting.

- A total of 100 patients with PI, majority females, median age 53 received 4,170 infusions of IGSC 16.5% for up to 52 weeks. Predominant diagnosis was common variable immunodeficiency. A third received IGIV prior to IGSC 16.5% and 28% were naïve to IG therapy.
- IGSC 16.5% was effective in the treatment for PI with a low incidence of SBIs.
- The safety profile was favorable with IGSC 16.5% with an overall low rate of observed systemic AEs of 0.23. Local reactions significantly decreased over time with subsequent infusions.
- Patients reported good tolerability with IGSC 16.5%, with the majority of ISRs experienced in the initial infusions.
- Overall IGSC 16.5% treatment adherence at 12 months was excellent.
- In the cohort of patients that previously experienced IG, the administration of IGSC 16.5% resulted in an improvement of quality of life across all domains. Notably, pronounced benefits were evident among individuals transitioning from IGIV therapies.

IGSC 16.5% provided through physician clinics demonstrated efficacy, safety, tolerability and treatment adherence through one year of infusions.

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