Poster #105

Immune Globulin Subcutaneous 16.5% in the Treatment of Primary Immunodeficiency: A Two-Year Multicenter Analysis

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Key Findings

- **This real-world study of IGSC 16.5% in treatment of PID demonstrates effectiveness over 2 years with a low rate of SBIs.**
- **IGSC 16.5% had a favorable safety profile with respect to systemic AEs and was well tolerated with low rates of ISRs in both treatment experienced and naïve patients.**
- **Overall, IGSC 16.5% was successfully initiated by immunologists and infection disease physicians in their office settings with the support of specialty trained IGSC nurses and pharmacists. This led to efficacious, safe, tolerable and compliant treatment.**

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Background

- Immune globulin subcutaneous (IGSC) 16.5% is indicated for treatment of primary humoral immunodeficiency (PID) in adults and pediatric patients ≥ 2 years and older[1]. IGSC 16.5% has been shown to be efficacious in prevention of infection in PID[2,3]. IGSC treatments offer fewer systemic ADRs and a more consistent pharmacokinetic profile in patients with PID when compared to IGIV[4]. IGSC can be self-administered, and studies have shown that it leads to improved QOL and greater adherence to treatment among individuals with PID[5].
- IGSC administration provided through a physician office infusion center with nursing and pharmacy services has demonstrated efficacy and medication compliance[6,7]. In a recent real-world study, IGSC 16.5% was well tolerated, safe and effective in 74 patients receiving 18 months of therapy[8] . Building upon these findings, the aim of this study was to evaluate real-world outcomes of IGSC 16.5% in patients with PID over a 2-year period.

Methods

- A retrospective, observational review was conducted in adult patients with PID who received IGSC 16.5% (Cutaquig®) continuously over a 2-year period. Patients were included who initiated therapy between June 2019 and July 2021, with data collected through July 2023. Eligible patients had a diagnosis of PID, initiated IGSC 16.5% treatment in infectious disease or immunology practices and completed 24 months of treatment. Patients included in the review were either treatment naïve (minimum of six months with no Ig therapy) or had previously received IGIV or IGSC therapies.
- Treatment initiation and training occurred in physician offices and was conducted by IGSC-trained pharmacists and nurses. Pharmacists dispensed medication and and supplies and performed monthly assessments to capture PROs.
- Data collected included baseline demographics and disease characteristics, IGSC 16.5% therapy parameters, patient-reported adverse events (AEs), reactions associated with infusion, and treatment adherence (e.g., utilization within ±2 days of scheduled treatment)
- Primary endpoints were:
  - Efficacy, defined by the rate of serious bacterial infections (SBIs) per person-year. This included bacterial pneumonia, osteomyelitis/septic arthritis, bacteremia/sepsis, visceral abscess and bacterial meningitis. Overall rates of respiratory tract infections (RTIs) per person-year were also captured.
  - Safety, assessed by annual rates of systemic AEs
  - Tolerability, assessed by annual rates of local infusion site reactions (ISRs)
- Descriptive analyses were reported as frequencies and proportions for categorical variables, and as mean ± SD or median (IQR) for continuous variables. Linear regression modeling was used for the incidence of ISRs and AEs as a function of infusion number.

Study Patients

Table 1. Demographics, Dosing and, Administration

Parameter	IGSC 16.5% N=67
Female Sex, n (%)	57 (85%)
Age groups, n (%)	
18 to 24 years	4 (6%)
25 to 64 years	50 (75%)
≥ 65 years	13 (19%)
Body weight in kg, median (IQR)	76.2 (64.9, 92.8)
Body mass index in kg/m², median (IQR)	28.1 (24.4, 34.7)
PI primary diagnosis, n (%)	
Common variable immunodeficiency (CVID)	43 (64.2)%
Selective deficiency of IgG subclasses	9 (13.4%)
Nonfamilial hypogammaglobulinemia	9 (13.4%)
Other[a]	6 (9.0%)
IGSC 16.5% Doses, median (IQR)	
Weekly dose (mg/kg)	137.5 (108.6, 156.2)
Monthly dose (mg/kg)	550 (434.3, 624.7)
IGSC 16.5% Infusions, median (IQR)	6997
IGSC 16.5% Administration, median (IQR)	
Initial rate per infusion site (mL/hr)	7.9 (7.2, 11.0)
Initial rate per all infusion sites (mL/hr)	23.6 (23.6, 27.0)
Initial volume per infusion site (mL)	20 (14,54)
Maximum rate per all infusion sites (mL/hr)	66.4 (49.8, 76.1)
Maximum volume per infusion site (mL)	22 (19.5, 26.7)
Number of infusion sites	3 (3, 4)

Figure 1. IG treatment History

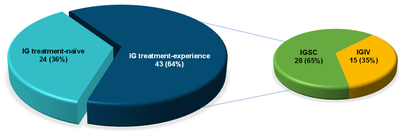
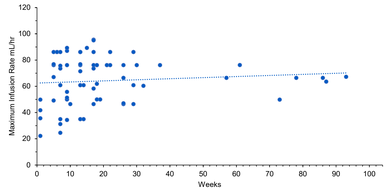


Figure 2. Time to Achieve Maximum Infusion Rate (all infusion sites)



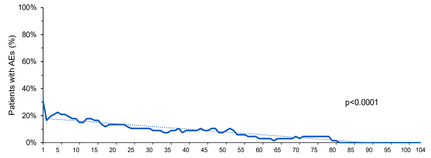
- Infusion rates increased over time in 96% of patients to a median maximum infusion rate of 66.4 mL/hr
- Almost all (90%) achieved a maximum rate at 24 weeks
- Infusion ramping occurred in all except 4 patients during the study period

Safety

Table 2. Systemic AEs by Patient and Infusion

Systemic AEs	By Patient (N=67) n (%)	By Infusion (N=6997) n (rate)
Fatigue	21 (31%)	399 (0.057)
Headache	18 (27%)	148 (0.021)
Nausea/vomiting	6 (9%)	48 (0.007)
Myalgia/arthralgia	4 (6%)	14 (0.002)
Fever/chills	4 (6%)	30 (0.004)
Muscle spasm	2 (3%)	9 (0.001)
Oral ulcers	1 (1%)	12 (0.002)
Light headedness	1 (1%)	5 (0.001)
Dyspepsia	1 (1%)	1 (0.001)

Figure 4. Incidence of Systemic AEs Over 24 Months



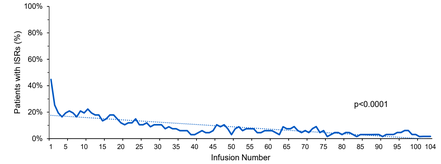
- A total of 666 systemic AEs were reported in 31 (46.2%) patients resulting in a rate of 0.09 per infusion
- The rate of systemic AEs was 0.02 in those who previously received IGIV, 0.05 in those on previous IGSC and 0.02 in those who were treatment naïve

Tolerability

Table 3. ISRs by Patient and Infusion

Local ISRs	By Patient (N=67) n (%)	By Infusion (N=6997) n (rate)
Swelling	29 (43%)	394 (0.056)
Redness	24 (36%)	273 (0.039)
Pain	24 (36%)	83 (0.012)
Itching	20 (30%)	131 (0.019)
Bruising	9 (13%)	37 (0.005)
Leaking	9 (13%)	64 (0.009)
Bleeding	4 (6%)	6 (0.001)
Burning	2 (3%)	2 (0.001)

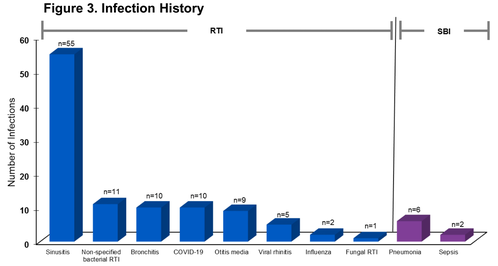
Figure 5. Incidence of ISRs Over 24 Months



- A total of 990 ISRs were reported in 48 (71.6%) patients resulting in a rate of 0.14 per infusion
- The rate of ISRs was 0.06 in those who previously received IGIV, 0.02 in those on previous IGSC and 0.06 in those who were treatment naïve

Efficacy

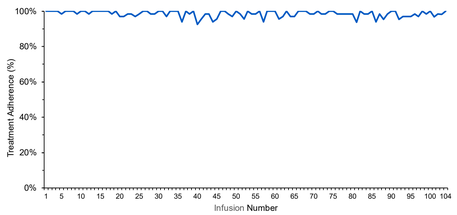
Figure 3. Infection History



- 8 SBIs (pneumonia n=6 and sepsis n=2), resulted in an annual rate of 0.06 infections/subject/year
- 5 SBI patients were hospitalized for a mean of 5.2 days
- All SBI patients resolved infection without discontinuation of IGSC 16.5%

Adherence

Figure 6. Adherence Over 24 Months



- Of the 6997 infusions administered over 2 years, 6895 were self-administered within ±2 days of the treatment window
- This reflects an overall treatment adherence rate of 98.5%

DISCUSSION

- 67 patients with PID received self-administered IGSC 16.5% at immunology and infectious disease physician office infusion centers over 2 years, with a predominance of female patients and a median age of 53 years. The sex and age distribution of this cohort corresponded to that of the participants in the clinical trial for IGSC 16.5%[2].
- Most patients were treatment experienced, although over one-third were Ig treatment-naïve of IGSC 16.5%. Predominant PID diagnosis was CVID, and standard dosing was observed for treatment of PID, with all doses administered weekly.
- IGSC 16.5% has proven to be effective over 2 years in real-world long-term use as shown by a low annualized rate of SBIs. All SBIs resolved and overall RTIs were mild to moderate. These results compare to the IGSC 16.5% long term clinical trial extension study[3] .
- The patient population demonstrated high adherence to the therapeutic regimen and greater compliance than noted in another long-term study[3].
- Safety, as assessed by the rate of systemic AEs, was higher than reported in clinical trials, where fatigue, our most common AE, was not reported[2,3]. AEs significantly decreased over time, with none occurring after 20 months of treatment. Over half of the patients exhibited no systemic AEs.
- Rates of ISRs were slightly lower than those reported in the clinical trial extension study[3]. Our study also included naïve patients, who reportedly experienced more ISRs[8]. As expected, swelling and redness were the most common and decreased over time.
- Overall, this data suggests that IGSC 16.5% is well-tolerated both initially and over time.

Abbreviations and Definitions

Abbreviations: ADR, adverse drug reaction; Ig, Immunoglobulin; IGIV, Immune Globulin Intravenous, IQR, Interquartile Range; PRO, Patient Reported Outcome; QOL, Quality of Life; SD, Standard Deviation

Definitions: [a]Other includes antibody deficiency with near-normal immunoglobulins or with hyperimmunoglobulinemia (n=4), hereditary hypogammaglobulinemia (n=1), other immunodeficiencies with predominantly antibody defects (n=1)

References

1. Cutaquig® (immunoglobulin human subcutaneous) [package insert]. Octapharma USA, Inc., Paramus, NJ, 2021.
2. Kobayashi RH, et al. *Front Immunol* 2019; 10: 40.
3. Kobayashi RH, et al. *Immunotherapy* 2021;13(10): 813-824.
4. Jolles S, et al. *Clin Exp Immunol* 2015; 179(2): 146-160.
5. Kobrynski L, *Biologics* 2012; 6: 277-287
6. Herrscher RF, et al. *J Allergy Clin Immunol* 2020; 146(2): AB33.
7. Langford J, et al. *J Allergy Clin Immunol* 2023; 151(2): AB81.
8. Langford J, et al. *Ann Allergy Asthma Immunol* 2023; 131 S15–S94: P170.

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