Cost-minimization Analysis of IgPro20, a Subcutaneous Immunoglobulin, in Japanese Patients With Primary Immunodeficiency

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ABSTRACT

Purpose: IgPro20, Hizentra® an L-proline–stabilized 20% human subcutaneous immunoglobulin (SCIG), has been shown in a Phase III pivotal study to be well tolerated and efficacious in adult and pediatric Japanese patients with primary immunodeficiency. Economic aspects of SCIG treatment in comparison with previous intravenous immunoglobulin (IVIG) therapy were analyzed in this Phase III study in Japan.

Methods: Twenty-four Japanese patients with primary immunodeficiency on IVIG treatment were switched to IgPro20 at an equivalent dose (full analysis set). The study consisted of a screening period, an IVIG treatment period with 3 planned infusions every 3 or 4 weeks, a 12-week SCIG wash-in and wash-out period, and a 12-week SCIG efficacy period. The difference in medical cost and productivity loss resulting from changes in hospital frequency between the SCIG and IVIG treatment was evaluated. Information about treatment cost was collected as part of the Life Quality Index questionnaire. In addition, productivity loss and hospital-related absenteeism were evaluated.

Findings: Life Quality Index scores for all domains were higher with SCIG than with IVIG in this patient population. In the full analysis set, the mean (SD) Life Quality Index score of the Costs domain increased from 45.1 (26.34) at Week 1 (IVIG period) to 71.9 (18.52) at Week 24 (end of the SCIG efficacy period), representing a mean change of 26.74 and a large score improvement effect size (1.01). Median productivity loss was reduced by 60% from baseline to Weeks 12 and 24. This resulted in a reduction in costs of JPY 10,875 per patient per month at Weeks 12 and 24. Subcutaneous treatment with IgPro20 also reduced hospital-related absenteeism. The number of patients, parents, or guardians who were not absent from work or housework duties and had no reduction in working time increased from 4 (17.4%) at Week 1 to 9 (39.1%) at Week 24. Similar results were obtained in the per-protocol set (n = 21).

Implications: Switching from IVIG to SCIG reduced markedly productivity loss and hospital-related absenteeism. The reduction in hospital visit frequency due to the use of home-based IgG therapy enabled by the change in administration route is expected to produce an important pharmacoeconomic benefit in Japan. Study Code: ZLB06_002CR, ClinicalTrials.gov identifier: NCT01199705. (*Clin Ther.* 2014;36:1616–1624) © 2014 The Authors. Published by Elsevier HS Journals, Inc.

Key words: cost minimization, home-based therapy, immunoglobulin replacement therapy, pharmacoeconomics, productivity loss, subcutaneous IgG.

INTRODUCTION

Primary immunodeficiency diseases (PID) include a range of disorders that are characterized by an intrinsic defect in the immune system, predisposing the patient to recurrent infections.[1–3] Patients with PID require regular administration of immunoglobulin G (IgG) to prevent infection and maintain quality of life. Prevalence of PID in Japan was determined in a

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recent nationwide survey (n = 1240) to be 2.3 patients with PID per 100,000 inhabitants, with minimal variations across the country regions.[4]

The current standard practice for PID treatment in Japan is intravenous IgG (IVIG) treatment every 3 or 4 weeks. Subcutaneous IgG (SCIG) administration has been used in Scandinavian countries for many decades and is now becoming more popular in the rest of the world due to the availability of 16% and 20% SCIG products.[5–7] SCIG treatment is rarely associated with systemic adverse events and infusion-related reactions are usually mild.[7–10] There are no venous access issues with SCIG, which is a particular advantage in infants.[7,9] In addition, SCIG administration results in stable serum IgG levels compared with the peak and trough concentrations characteristic of IVIG.[7,10,11] Last but not least, although IVIG requires a hospital visit for its administration, SCIG can be administered at home by self-infusion or by caregivers (parents or guardians).

IgPro20* (L-proline–stabilized 20% human SCIG) is a concentrated SCIG with established efficacy and tolerability in patients with PID. A Phase III pivotal study of IgPro20 in Japanese patients with PID showed that weekly SCIG treatment with IgPro20 was effective in pediatric and adult patients and was tolerated well.[12] The results obtained concur with those seen in previous European[13] and North American[10] trials of IgPro20, suggesting that SCIG could be an alternative treatment opportunity in Japan. IgPro20 has recently been approved in Japan for the treatment of PID and secondary immunodeficiency.

Several studies have shown or suggested a reduction in costs with SCIG treatment compared with IVIG treatment.[14–17] In Germany, SCIG was found to be 50% less expensive than IVIG due to the reduced costs for treatment procedures and the avoided absence from work.[15] SCIG was predicted to be more cost-effective than hospital-based IVIG in Canada.[17] Additional studies are needed to evaluate the costs of SCIG versus IVIG, mainly focusing on the difference in medical cost as well as productivity loss, resulting from the difference in hospital-visit frequency. Economic aspects of SCIG treatment in comparison with previous IVIG therapy analyzed in the Phase III pivotal study in Japan are reported here.

*Trademark: Hizentra® (CSL Behring, Berne, Switzerland).

METHODS

Study Design

This study aimed to evaluate the economic value, in terms of cost of health care, of SCIG with IgPro20 versus IVIG in patients with PID by performing a cost-minimization analysis focused on changes in productivity loss due to the difference in administration route. The cost-minimization analysis was conducted as part of the Japanese pivotal Phase III study for IgPro20 (Study Code: ZLB06_002CR, ClinicalTrials.gov identifier: NCT01199705).[12] This study was designed as a prospective, multicenter, open-label, single-arm study with comparison of clinical outcomes before and after switch to treatment with IgPro20. Patients with PID on IVIG treatment (ambulatory care) were switched to self-infusion of subcutaneous IgPro20 at an equivalent dose. The study consisted of a screening period, an IVIG treatment period with 3 planned infusions every 3 or 4 weeks, a 12-week SCIG wash-in and wash-out period, and a 12-week SCIG efficacy period followed by a completion or discontinuation visit. The study was approved by Independent Ethics Committee and Institutional Review Board at each site.

Patients

Patients with PID requiring immunoglobulin-replacement therapy who completed the study were included in the pharmacoeconomic analysis.

Pharmacoeconomic Assessments

SCIG self-infusion of IgPro20 at Week 24 was compared with ambulatory care with IVIG at Week 1 (baseline data). The influence of SCIG treatment on pharmacoeconomics and health-related quality of life in patients with PID was evaluated by several patient-reported outcomes. Information about treatment cost was collected as part of the Life Quality Index (LQI) questionnaire, domain Costs.[18] The LQI included 15 questions addressing the following domains: Treatment Interference (interference of IgG therapy with work, school, family, and social life), Therapy-Related Problems (convenience of infusions, their painfulness, their impact on health improvement), Therapy Setting (how pleasant and convenient the environment was in which treatment was conducted), and Costs (cost of therapy and transportation to and from the location of therapy), as well as Total Score describing health-related quality of life overall.