Treatment of Primary Immunodeficiency with Kiovig®: a Literature Review

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ABSTRACT

Introduction: Primary immunodeficiency disorders are associated with increased patient susceptibility to recurrent infections. Since the 1950s, immunoglobulin products have been administered to treat infections in primary immunodeficiency, and patients often require lifelong therapy. The aim of this study is to carry out a literature review of a ready-to-use 10% liquid immunoglobulin preparation, Kiovig® (Baxter, Brussels, Belgium), in the treatment of primary immunodeficiency. Methods: Studies were identified by searching PubMed, Centre for Reviews and Dissemination databases, Cochrane Database of Systematic Reviews, and EconLit up to January 2010. The clinical literature review focused on studies of the safety, tolerability, and effectiveness of Kiovig. Evidence about cost-effectiveness was derived from economic evaluations. In addition, budget impact analyses were identified that examined the financial impact of adopting Kiovig for the treatment of primary immunodeficiency. Results: The evidence indicates that Kiovig and other intravenous immunoglobulin products have similar safety and effectiveness. Given that Kiovig and other intravenous immunoglobulin products appear to have similar effectiveness, the pharmacoeconomic value of Kiovig depends on the costs of immunoglobulin treatment, including drug acquisition costs, and pharmacist and nursing time costs. A Belgian study indicated that the price of Kiovig is the main driver of its budget impact on the treatment of primary immunodeficiency. Conclusion: The current evidence base on the treatment of primary immunodeficiency with Kiovig is limited. Head-to-head comparative studies are called for to investigate the safety, tolerability, effectiveness, and cost-effectiveness of Kiovig versus other immunoglobulin products in the treatment of primary immunodeficiency.

Keywords: budget impact; cost-effectiveness; effectiveness; intravenous immunoglobulin; Kiovig; primary immunodeficiency; safety
INTRODUCTION

Immunoglobulins are proteins that are produced by B lymphocytes and plasma cells, and that form a part of the humoral immune system. Antibodies are immunoglobulins produced in response to antigens. Deficient or absent antibody production occurs in primary immunodeficiency disorders that are characterized by low or undetectable immunoglobulin levels. A wide variety of primary immunodeficiency disorders exist, including X-linked agammaglobulinemia and hypogammaglobulinemia, common variable immunodeficiency, severe combined immunodeficiency, and Wiskott-Aldrich syndrome.

The prevalence of primary antibody deficiency varies according to the specific syndrome. For instance, isolated IgA deficiency has a prevalence of about one patient per 600 individuals, whereas other syndromes are more rare, with prevalence rates of one patient per 10,000 or 100,000 individuals. The literature points to a prevalence rate of one patient per 500 individuals for primary immunodeficiency. However, not all patients are diagnosed and it is estimated that one patient per 500 individuals is never diagnosed. There is also uncertainty about the need for treatment. The proportion of patients requiring immunoglobulin treatment is estimated at 30%.

Primary antibody deficiency is associated with an increased susceptibility to recurrent bacterial infections affecting the respiratory tract and gastrointestinal canal. Immunoglobulin treatment is the mainstay of therapy for infections, and patients often require lifelong immunoglobulin therapy. Immunoglobulin therapy replaces functionally deficient or absent immunoglobulins, reduces the incidence of infections, and prevents organ damage caused by recurrent infections.

Since the 1950s, immunoglobulin products have been administered to patients suffering from primary immunodeficiency. Administration routes have evolved over time, from the initial intramuscular preparations to intravenous preparations since the 1960s and 1970s and subcutaneous preparations since the 1980s. The intravenous route allows larger immunoglobulin doses to be administered, enables a fast onset of action, and has been demonstrated to be safe, effective, and well-tolerated. However, adverse events may occur, administration in patients with poor venous access is difficult, and the cost of intravenous infusion is high.

Kiovig® (intravenous human immunoglobulin, Baxter, Brussels, Belgium), a ready-to-use 10% liquid immunoglobulin preparation, is medically indicated for the treatment of, among other indications, primary immunodeficiency disorders. This plasma-derived product consists of a highly purified preparation of human immunoglobulin. It is supplied as a ready-to-use liquid formulation with a pH of 4.6-5.1. Three dedicated virus clearance steps are integrated in the manufacturing process and the resulting product exhibits an intact immunoglobulin molecule with complete functional activity. Kiovig is supplied in single-dose vials that nominally contain 1 g, 2.5 g, 5 g, 10 g, and 20 g protein per vial. The European Commission granted a marketing authorization valid throughout the European Union for Kiovig in January 2006.

The aim of this study is to conduct a literature review of Kiovig in the treatment of primary immunodeficiency. The literature study reviews the evidence on the safety, tolerability, effectiveness, cost-effectiveness, and budget impact of Kiovig in the treatment of primary immunodeficiency. The findings may serve to aid local decision-makers in allocating scarce healthcare resources, and to inform the