Dose Cycling Patterns In Epoetin Alfa Use In United States Hemodialysis Patients

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INTRODUCTION

Dose cycling (DC) refers to the within-patient variation in erythropoiesis-stimulating agent (ESA) dosing from week to week and month-to-month in response to oscillations in patient hemoglobin (Hb) concentration (Figure 1). DC occurs for a number of reasons, including the lag time between ESA administration and Hb response and the lack of an optimal dose/response algorithm.

For most patients, ESA response typically varies over time and may change due to a variety of causes and illnesses, including iron deficiency, infection, volume overload and missed dialysis sessions.

When adjusting doses, physicians must take multiple factors into consideration, including both the level and rate of change in Hb. Thus, ESA doses are routinely adjusted with the clinical goals of limiting Hb fluctuations, preventing excessive Hb rises and changing Hb overshoot.

OBJECTIVE

To describe patterns of within patient month-to-month dosing variations in U.S. hemodialysis patients taking epoetin alfa between January 2010 and July 2014.

METHODS

Dosing data were taken from the Outcomes Plus database, an Amgen proprietary database of clinical data which contains information on approximately 40-80% of the entire U.S. dialysis population. This analysis was based on in-center hemodialysis patients only. Cohorts of patients who had dosing data for at least 7 consecutive months from January or from July of each year were selected from sampling frames of all patients in the database as of the index month (January or July).

Doses were tracked for six months after the index month. Average weekly doses of epoetin alfa were calculated for each month. The top and bottom 1% average weekly dose outliers for each month were removed from the analysis.

Doses were categorized into 8 ranges (units/week) based on ranges defined for dose conversions in the Anemia® product insert: 0, 1500 to < 2500, 2500 to 3400, 3400 to < 9000, 9000 to < 20,000, 20,000 to < 30,000, 30,000 to < 45,000, > 45,000.

RESULT

The mean(SD) cohort size was 205,911(8,667) patients. The sampling frames at each index month contained data which contains information on approximately 80%

RESULTS

Dose cycling is also consistent across dose categories. For example, in the January 2014 cohort, the percent of patients remaining in their index month dose category six months later ranged from 17% in the 1000 to < 2000 category to 38% in the 5000 to < 11000 category (Figure 6).

Figure 1: Dose Cycling in Sample Patients

Figure 2: Dose Category Changes over 6 Months

Figure 3: Dose Category Consistency over 6 Months

Figure 4: Dose Changes 2010-2014

Figure 5: Dose Category Consistency 2010-2014

Figure 6: % Patients Who Were in Index Month Dose Category 1, 3 and 6 Months Later

DISCUSSION

Between 2010 and 2014 in our large samples of U.S. hemodialysis patients, about 1 out of 4 patients experienced at least 5 ESA dose changes over six months, with 5% or less experiencing no dose changes.

References


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RECEIPTS