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Evaluation of Rituximab Use at Parkview Health

Sarah Stopczynski PharmD Candidate

Jesse Christman PharmD, BCOP

Kristen Christman PharmD, BCPS

Jamie Gaul PharmD, BCPS

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Sarah Stopczynski, PharmD Candidate[1]; Jesse Christman, PharmD, BCOP[2]; Kristen Christman, PharmD, BCPS[2]; Jamie Gaul, PharmD, BCPS[2]

1. Butler University College of Pharmacy, Indianapolis, Indiana 2. Parkview Regional Medical Center, Fort Wayne, Indiana

OBJECTIVE

- Characterize the use of rituximab at Parkview Health by differentiating between inpatient and outpatient use as well as evaluate indications for use, incidence of documented infusion reactions, and biosimilar use

BACKGROUND

- Rituximab is a monoclonal antibody targeting the CD20 surface antigen on pre-B and mature B-lymphocytes and mediates B cell lysis[1]
- FDA-approved indications for rituximab include adult Non-Hodgkin's Lymphoma (NHL), pediatric mature B-cell NHL and B-cell Acute Leukemia in patients 6 months and older, adults with Chronic Lymphocytic Leukemia (CLL), Rheumatoid Arthritis (RA), Granulomatosis with Polyangiitis (GPA) and Microscopic Polyangiitis (MPA), and moderate to severe Pemphigus Vulgaris (PV)[1]
- Rituximab also has many off-label indications including other hematologic malignancies, antibody-mediated organ rejection, and autoimmune conditions[2]
- Although not approved as interchangeable, there are three FDA-approved biosimilars (rituximab-pvvr, rituximab-abbs, rituximab-arrx)[3]
- To prevent hypersensitivity reactions, pretreatment with an antihistamine and analgesic/antipyretic, with or without a corticosteroid, is recommended[1]
- Hepatitis B virus (HBV) screening prior to rituximab initiation is important to prevent reactivation[1]
- For some indications, rapid rituximab infusions can be used for subsequent infusions after an initial tolerated infusion[1]
  - Rapid infusion: 20% of the dose is given over 30 minutes and the remaining 80% is given over 60 minutes[1]

METHODS

- Retrospective study of data collected from the electronic health record
  - Subset of data was manually validated for accuracy
  - Study was approved by the Parkview Health Institutional Review Board (IRB)
- Inclusion Criteria
  - All patients who received at least one dose of reference rituximab or rituximab biosimilars from May 1, 2020 through April 30, 2022 at any hospital or outpatient infusion location within the health system
- Exclusion Criteria
  - Patients who received rituximab hyaluronidase during the study time frame
- Patient medication classification was defined by what product(s) was/were used for the dose series
  - Reference rituximab if the patient received the reference product
  - Biosimilar if the patient received a biosimilar for all of their doses
  - Rapid if they received a rapid infusion for any of their doses
  - Other if they received a combination of a biosimilar and reference product
- Appropriate premedication: defined as any dose of acetaminophen and diphenhydramine given by any route within 120 minutes prior to infusion start
  - Classified as complete if both were given; partial if either were given; none if neither were given
- Appropriate HBV testing was defined as HBV core total and HBV surface antigen testing completed within 6 months prior to the first dose
  - Classified as complete if both were completed; partial if only one test was completed; none if neither test was completed
- Based on affiliated ICD-10 codes, FDA-approved and off-label indications were grouped by cancer type or generalized use[4]

RESULTS

- 292 patients screened for inclusion, 9 excluded, 283 patients included for analysis for a total of 1255 doses

Patient Population Data (N=283)

Table 1

Characteristics	Study Population (N=283)
Sex (female)	124 (43.8%)
Age (years)	
<40	31 (11%)
40-59	72 (25.4%)
60-65	33 (11.7%)
>65	147 (51.9%)
Indication for Use	
FDA-Approved	239 (84.5%)
Off-Label	44 (15.5%)
Patient Medication Classification	
Reference Rituximab	174 (61.5%)
Rapid Reference Rituximab	83 (29.3%)
Rituximab Biosimilar	12 (4.2%)
Rapid Rituximab Biosimilar	9 (3.2%)
Other	5 (1.8%)
HBV Testing Compliance	
Complete	190 (67.1%)
Partial	49 (17.3%)
None	44 (15.5%)
Infusion-Related Reaction	57 (20.1%)

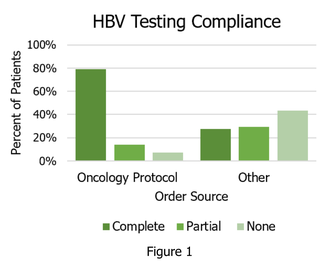

Figure 1

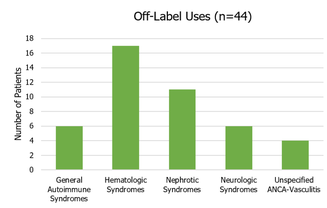

Figure 2

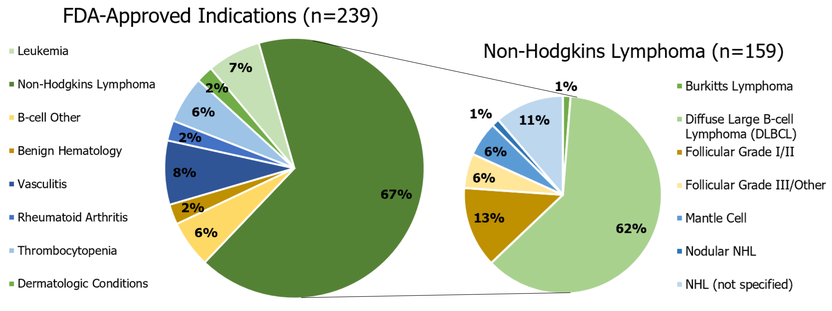

Figure 3

Dose Population Data (N=1255)

Table 2

Dose Characteristics	Population (N=1255)
Dosing	
Weight-based Dosing	1107 (88.2%)
Flat Dosing	145 (11.6%)
Unknown	3 (0.2%)
Protocols/Orderets	
Used	1103 (87.9%)
Not Used	152 (12.1%)
Premedications	
Complete	1203 (95.9%)
Partial	38 (3%)
None	14 (1.1%)

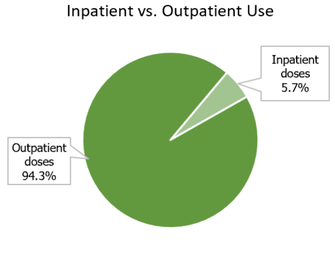

Figure 4

RESULTS

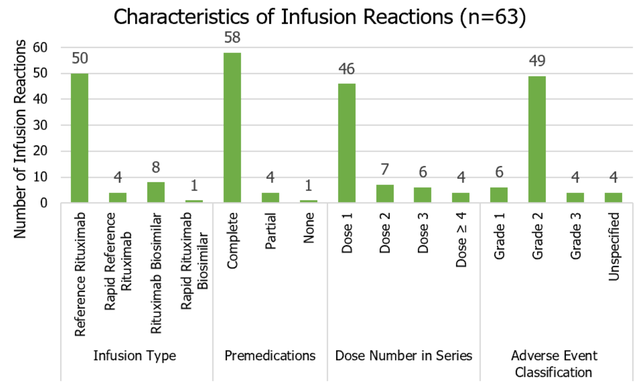

Figure 5

DISCUSSION & CONCLUSIONS

- The most common FDA-approved indications for rituximab use were DLBCL, Follicular Lymphoma Grade I/II, NHL, and ANCA-vasculitis.
- The most common categories of off-label uses were hematologic and nephrotic syndromes.
- The incidence of infusion reactions reported in literature ranges from 12% to 77% depending on the indication.[1] In this study, 20.1% of patients in this study had an infusion reaction.
- Initial doses ordered from an oncology protocol had a higher prevalence of complete HBV testing compared to those ordered separately.
- Doses ordered from an orderset or oncology protocol had a higher prevalence of appropriate premedication given (96.8% vs 88.8% respectively).
- Protocol usage was most common with FDA-approved indications; it may be beneficial to develop rituximab protocols for common off-label indications.
- With expanding utilization of rituximab and biosimilars, standardization of documentation will be necessary to track appropriate usage and patient outcomes.
- Limitations
  - Manual chart search for indication was limited by physician phrasing of diagnoses. Documentation of infusion reactions was variable.
  - Some patients may have received first doses outside of the study period which impacts infusion-related reaction rates.
  - Premedication with corticosteroid was not assessed due to a portion of patients receiving steroids at home prior to infusion.
- This evaluation demonstrated the importance of standardized protocols and ordersets to increase premedication utilization and HBV testing compliance

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Disclosure
The authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:
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