Expansion of Oncology Pharmacy Practice Through Bruton's Tyrosine Kinase Inhibitor Cardiovascular Assessments

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Background

- Bruton's tyrosine kinase (BTK) inhibitors are commonly used in chronic lymphocytic leukemia (CLL) and mantle cell lymphoma (MCL).[1] At diagnosis, patients are typically 60 to 70 years of age making them at an increased risk of adverse events and comorbidities.[2-4]
- The prevalence of hypertension (HTN) and atrial fibrillation (AF) have been found to be increased over time with BTK inhibitors.[5,6] Additional toxicities include bleeding, arthralgia, infection, rash, and diarrhea.[7,8]
- An opportunity was identified to increase clinical oncology pharmacist involvement in the selection, monitoring of adverse events, and management of BTK inhibitor toxicities as they routinely interact with patients on a monthly basis for medication refills.
- The purpose of this project is to expand clinical practice in the outpatient oncology setting by improving initial patient assessments at time of receiving new BTK inhibitor prescriptions and follow-up assessments of adverse events

Objectives

Primary Objective

- Evaluate the impact pharmacists have on the selection and management of BTK inhibitors

Secondary Objective

- Understand how increased involvement affects BTK inhibitor discontinuation rates and dose changes

Methods

Inclusion Criteria

- At least 18 years of age
- Diagnosis of CLL/small lymphocytic lymphoma (SLL), marginal zone lymphoma (MZL), MCL, or Waldenstrom macroglobulinemia (WM)
- Treated with single agent BTK inhibitor or combination therapy
- Actively followed by medically integrated oncology pharmacy

Exclusion Criteria

- Diagnosis of graft versus host disease (GVHD)
- Clinical trial participation that involves a BTK inhibitor
- Incarcerated

Pre-implementation Phase

- Perform multicenter, retrospective chart review to gather patient data and implement initial BTK inhibitor cardiovascular assessments and follow-up assessments
- Develop educational documents to standardize initial and follow-up assessments
- Educate pharmacy staff on new processes at team meetings

Post-implementation Phase

- Perform multicenter, prospective chart reviews evaluating initial and follow-up assessments performed by pharmacists

Results

Table 1. Baseline Characteristics

Characteristic	Pre-implementation Phase (n = 73)
Median Age (years)	71.2
Male Sex (%)	45 (61.6)
Diagnosis (%)	
▪ CLL/SLL	63 (86.3)
▪ WM	7 (9.6)
▪ MZL	2 (2.7)
▪ MCL	1 (1.3)
Race (%)	
▪ Caucasian	71 (97.3)
▪ African American	1 (1.3)
▪ Other	1 (1.3)

Figure 1. BTK Inhibitor Selection

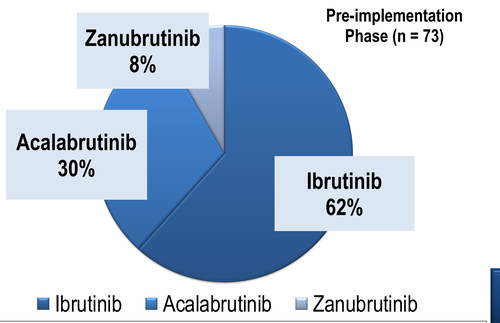

Figure 2. Initial Cardiovascular Risk Factor Assessment

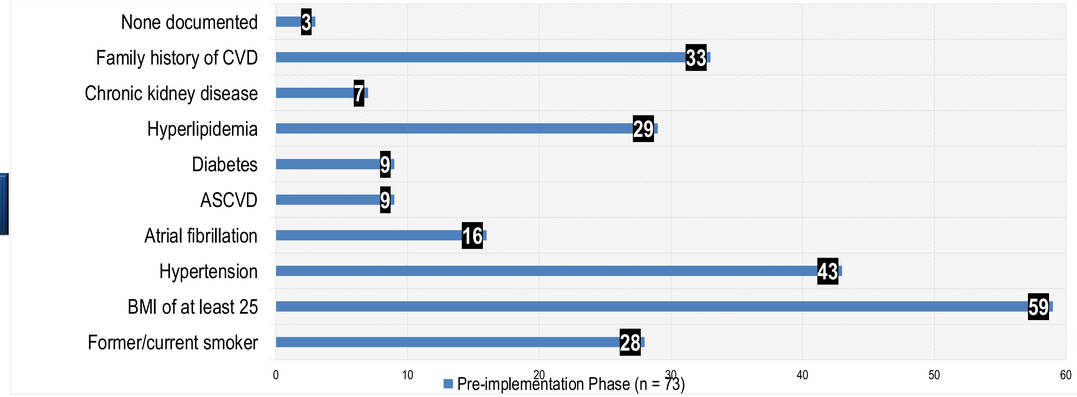

Figure 3. Baseline EKG Order Assessment

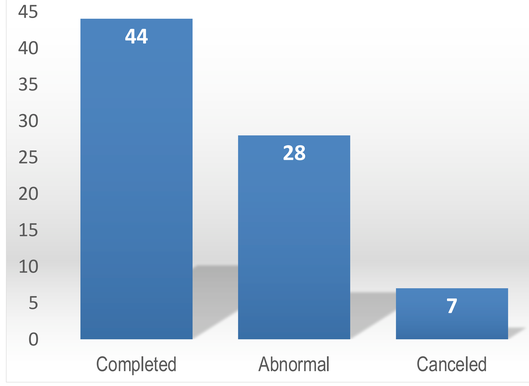

Table 2. Cardiotoxicity Assessment

Variable	Pre-implementation Phase (n = 73)
Development of HTN or AF (%):	
▪ HTN	7 (9.6)
▪ Worsening HTN	14 (19.2)
▪ AF	3 (4.1)
▪ HTN/Worsening HTN + AF	5 (6.8)
Dose change due to HTN or AF (%)	2 (8.3)
Addition of antihypertensive	22 (30.1)
Antihypertensive dose adjustment	21 (28.8)
Frequency of EKG monitoring:	
▪ 1-2 months	10 (13.7)
▪ 3-4 months	3 (4.1)
▪ 5-12 months	15 (20.5)

Discussion

Current Impact

- 78 initial cardiovascular assessments and 44 follow-up assessments have been completed by pharmacists which has led to positive interactions with patients and providers further establishing trust and improved patient care
- Two successful BTK inhibitor transitions due to pharmacist intervention
- Collaboration with newly established cardio-oncology department

Limitations Identified

- Missed opportunities due to workflow adjustment or misunderstanding
- Dose reductions for cytopenias and thrombocytopenia are not captured which would also lower the risk for HTN, worsening HTN, or AF

Post-implementation phase data continues to be collected

Future Directions

- Continued utilization of the current collaborative practice agreement (CPA) through the development of additional drug class-specific assessments
- Development of a pharmacy driven protocol for initial BTK inhibitor drug selection

References

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Disclosures

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