Major Ischemic or Hemorrhagic Events and Associated Costs Among Anticoagulated Patients with Non-Valvular Atrial Fibrillation in US Health Plans

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Introduction

- Non-valvular atrial fibrillation (NVAF) is a cardiovascular condition affecting approximately 1% of the United States (US) population and is associated with substantial clinical burden.[1]
- Current clinical practice guidelines recommend anticoagulants as treatment for AF, with direct oral anticoagulants (DOACs) being the most recently approved class of treatments on the market, and with superior adverse event (AE) profiles as compared to the warfarin standard of care (SoC).
- Two comparative effectiveness and safety analyses of apixaban and rivaroxaban among NVAF patients in the US were recently published[2,3]. These studies suggested that patients treated with apixaban demonstrated lower rates of clinical events as compared to patients treated with rivaroxaban.

Objective

- Applying findings from the recent comparative analyses, costs of major ischemic and haemorrhagic events were estimated for apixaban and rivaroxaban from a US payer perspective.

Methods

Overview

- A cost model was developed to estimate the costs associated with treatment of atrial fibrillation with apixaban or rivaroxaban in a 1-year time horizon among US NVAF patients. The base case analysis included rates of major ischemic and hemorrhagic events in NVAF patients treated with apixaban or rivaroxaban and unit costs for these events (in 2022 USD) from published literature. Total cost per year (TCPY) and per-treated patient cost per year (PTPCPY) were calculated for apixaban- and rivaroxaban-treated NVAF patients. Separate analyses were conducted for commercial and Medicare plan perspectives. Scenario analyses assessed the cost impact of changing market share.
- Clinical events were restricted to those identified in both the Ray et al.[3] and Fralick et al.[2]studies (ischemic stroke (IS), gastrointestinal (GI) bleeding, systemic embolism (SE), intracranial hemorrhage (ICH) and other bleeding).

Population

- The population was defined as a hypothetical health plan of 1,000,000 lives, with separate NVAF prevalence rates for populations under age 65 and over age 65 (0.9% and 10%, respectively)[1.] Commercial plans were assumed to consist of 100% patients under age 65, while Medicare plans were assumed to consist of 2% patients under age 65 and 98% patients over age 65. 80% of NVAF patients were assumed to be eligible for treatment with DOACs.

Clinical event rates

- Event rates from Ray et al. and Fralick et al. were reported separately for patients treated with apixaban or rivaroxaban. The event rates were reported per 1,000 patient-years and scaled down within the model accordingly to apply to the appropriate time horizon and population

Costs

- Unit costs for major ischemic and hemorrhagic events were obtained from published literature and inflated to 2022 USD.[4]
- Unit costs for treatments were obtained from Red Book.[5]

Analyses

- Total cost per year (TCPY) and per-treated patient cost per year (PTPCPY) were calculated for apixaban and rivaroxaban treated NVAF populations and patients, respectively.
- Hypothetical scenarios were generated to model population-level costs where the proportions of patients treated with apixaban varied from 0% to 100%, and all other patients were assumed to be treated with rivaroxaban.

Assumptions

- Only direct costs of clinical events were included in the analysis.
- Patients were assumed to be on treatment through the entire 12-month time horizon of the model with no discontinuation.
- Costs were assumed to be identical for the commercial and Medicare perspectives, with only age distribution and clinical event rates different between the two perspectives.

Table 1. Clinical event rates and costs

Event type	Age <65: Fralick et al. 2020 (per 1,000 patient-years); for commercial and Medicare perspectives		Age 65+: Ray et al. 2021 (per 1,000 patient-years); for Medicare perspectives		Cost per event [4]
	Apixaban	Rivaroxaban	Apixaban	Rivaroxaban	
Ischemic stroke	6.4	7.4	7.2	8.3	$20,153
GI bleeding	9.4	17.9	16.3	35.2	$9,131
Systemic embolism	0.3	0.6	0.3	0.4	$20,153
ICH	3.6	4.0	3.2	3.5	$144,490
Other bleeding	3.1	5.3	4.4	2.5	$9,131

Table 2. Treatment costs and dosing

Treatment	WAC[5]	Dosing	Pack Size	Unit Cost	Monthly Cost
Apixaban	$881.76	2 doses per day	100	$8.82	$493.79
Rivaroxaban	$2,066.51	1 dose per day	100	$20.67	$578.62

Results

Per-patient costs

- In the base case analysis for the Medicare perspective, combined per-patient costs of ischemic and hemorrhagic events were lower for patients treated with apixaban compared to rivaroxaban, driven by the lower likelihood of these events for apixaban, with PTPCPY of $6,727 for apixaban and $7,967 for rivaroxaban. Results were similar for a commercial perspective. For both perspectives, costs were found to be 16% lower for patients treated with apixaban as compared to patients treated with rivaroxaban.

Table 3. Costs of treatment by perspective, per patient per year

Cost category	Commercial perspective		Medicare perspective	
	Apixaban	Rivaroxaban	Apixaban	Rivaroxaban
Ischemic stroke	$129	$149	$145	$167
GI bleeding	$85	$164	$148	$318
Systemic embolism	$6	$12	$6	$8
ICH	$526	$571	$464	$507
Other bleeding	$28	$48	$40	$23
Pharmacy costs	$5,925	$6,943	$5,925	$6,943
Total	**$6,699**	**$7,887**	**$6,727**	**$7,967**

Population-level scenarios

- Analyses of total costs per year at varying levels of apixaban uptake demonstrate the implications of apixaban's lower PTPCPY.
- From a Medicare perspective, population-level costs ranged from $625.8 million for a scenario where 0% of NVAF patients were treated with apixaban and 100% of patients were treated with rivaroxaban, to $528.4 million for a scenario where 100% of NVAF patients were treated with apixaban and 0% of patients were treated with rivaroxaban. Figure 1 provides further detail on these scenarios.
- Results were similar for analyses run from a commercial perspective as seen in Figure 2.

Figure 1. Total costs per year of treating NVAF in a Medicare plan at varying levels of apixaban uptake

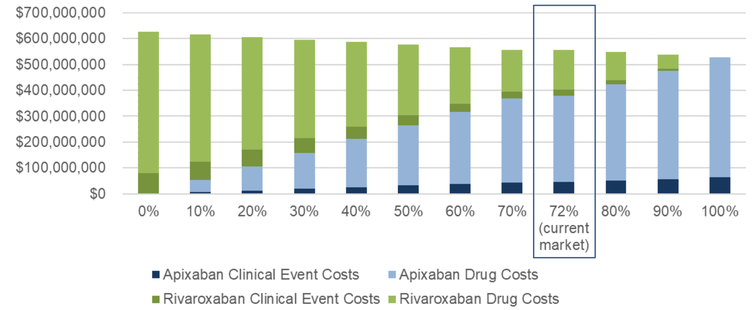
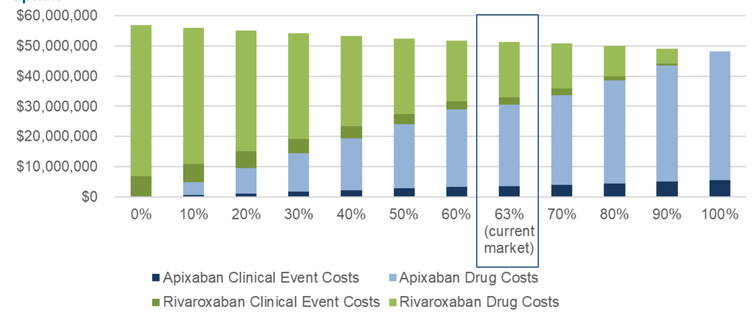


Figure 2. Total costs per year of treating NVAF in a commercial plan at varying levels of apixaban uptake



Limitations

- Cost inputs do not distinguish between payer types, and are not available for all modeled clinical events.
- Only treatment-naïve patients were modeled, and no assumptions about prior treatment were made.
- Other anticoagulants such as warfarin, edoxaban, and dabigatran were not considered as part of the analysis.

Conclusion

- **Estimated costs of management of ischemic and hemorrhagic events among NVAF patients were lower for apixaban compared to rivaroxaban by approximately 16% per patient for all perspectives.**
- **These results suggest cost savings for patients switching to apixaban from rivaroxaban.**

References

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Disclosures

This study was sponsored by Bristol Myers Squibb and Pfizer. Nipun Atreja, Amol D Dhamane, and Melissa Hagan are paid employees and shareholders of Bristol Myers Squib; Dionne Hines is a paid employee and shareholders of Pfizer; Charles Tao is a paid employee of Xcenda LLC, which is a paid consultant to Pfizer and Bristol Myers Squibb in connection with the development of this study

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