Abstract No.

COST-EFFECTIVENESS ANALYSIS OF APIXABAN IN ATRIAL FIBRILLATION INDICATION IN IRAQ (PRIVATE SECTOR)

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Background

- Atrial fibrillation (AF) is the most common cardiac rhythm disorder, accounting for 1/3rd of all hospitalizations for cardiac disturbances[1-3], and is associated with increased risk of morbidity and mortality[4]
- Individuals with AF have a 4-5 fold increase in risk of stroke compared to individuals without cardiovascular disease[5]
- Until recently, Vitamin K antagonists (VKA) were the only oral anticoagulants recommended as antithrombotic therapy in patients with moderate-to-high risk of stroke[6]. In patients who cannot tolerate VKA or in whom VKA treatment is contraindicated, aspirin, a moderately effective treatment option, has often been prescribed instead[6]
- Although effective in preventing thrombo-embolic events, therapeutic management through VKAs is complicated due to variable dose requirement, multiple drug–food and drug–drug interactions, and the need for frequent monitoring of international normalized ratios (INR)[6]
- As a result, bleeding complications are relatively frequent, and a high proportion of patients discontinues or receives suboptimal therapy in clinical practice[7]
- Apixaban is a novel oral anticoagulant and is an alternative to conventional VKA therapy or anti-platelet therapy[8]
- In two large multinational randomized trials, ARISTOTLE and AVERROES trials Apixaban was found to be superior to Warfarin and Aspirin in prevention of stroke and systemic embolism, bleeding outcomes and mortality.[9,10]
- However, the treatment costs and clinical benefits of Apixaban need to be evaluated further in the Iraqi context.

Objective

- To assess the cost-effectiveness of Apixaban over warfarin in VKA suitable patient and aspirin in VKA unsuitable patients with AF in Iraq, treated in the private healthcare sector.

Methods

- A Microsoft® excel-based Markov decision tree model with 11 health states was developed to evaluate the impact of introducing apixaban from the Iraqi private healthcare payer perspective.
- The model was built to compare the cost-effectiveness of using Apixaban compared to warfarin in VKA suitable patients and aspirin in VKA unsuitable patients over a lifetime horizon.
- The overall methodology and the base case settings of the model are outlined in Figure 1 and Table 1, respectively. The model inputs were as follows:
  - Treatment efficacy and safety: Data was obtained from the two Apixaban clinical trials AVERROES and ARISTOTLE[11,12]
  - Costs: The drug prices were retrieved from a survey of community pharmacies in Iraq. The routine care, unit costs per monitoring visit and anticoagulant management costs and events cost were obtained from interviews with clinical experts.
  - Utility : Utility values for atrial fibrillation, different severities of strokes, embolism and Myocardial Infarction were taken from a catalogue of EuroQol- 5 dimension (EQ-5D) scores for the United Kingdom.[13] Utility decrement values for anticoagulation and management were based on assumptions.
- Model Outputs: The model assessed the outcomes in terms of life-years (LYs), quality-adjusted life-years gained (QALYs), direct healthcare costs, and incremental cost-effectiveness ratios (ICER).
- Sensitivity Analysis: A one-way sensitivity analyses (OWSA) and probabilistic sensitivity analyses (PSA) were performed to assess the robustness of the model

Figure 1: Methodology

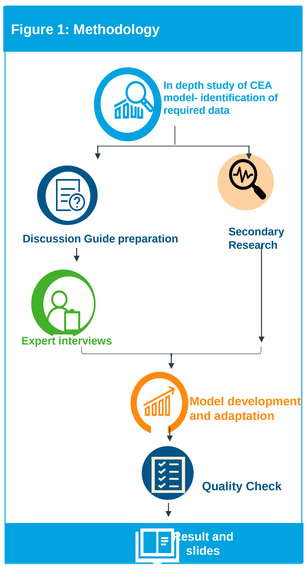


Table 1: Base Case Settings for model

Setting	Input/Source
Analytical tool	Microsoft® Excel
Time horizon	Lifetime
Cycle length	6 weeks
Currency	USD
Perspective	Private payer's perspective
Eligible patient population	Patients with AF, at risk of having a stroke and requiring anticoagulation for the prevention of thromboembolic events
Comparators considered	• Warfarin (in VKA suitable patients) • Aspirin (in VKA unsuitable patients)
Discounting	Costs and health outcomes: 3.5% for each

AF: Atrial Fibrillation; QALY: quality-adjusted life year; USD: United States Dollar; VKA: Vitamin K antagonists

- The Markov model consisted of 11 disease states and pathways that specify the transition among them.
- Only direct costs (drug acquisition, routine care, monitoring visit, anticoagulation management, and event costs) were included from the Iraqi private payer perspective.
- This study modelled only AF patients at risk of stroke and studied apixaban in comparison to warfarin and aspirin

Results

- Table 2 summarizes the results of the base case analysis demonstrating that compared with Aspirin (VKA unsuitable) & Warfarin (VKA suitable), the use of Apixaban (Both VKA suitable & unsuitable) resulted in 0.28 QALYs and 0.30 LYs gained at an incremental cost of USD 1,230.68; thereby, generating an ICER of USD 4,329.93/QALY gained and USD 4,159.11/LY gained

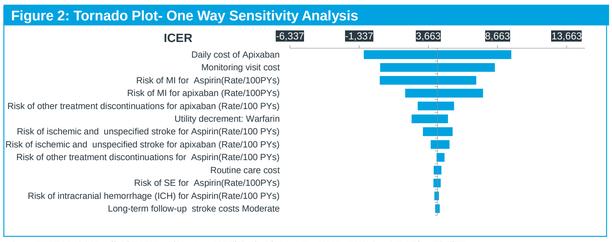
Table 2: Cost Effectiveness Analysis : Base case results

Treatment	Total costs	Incremental Cost	QALYs	Incremental QALYs	LYs	Incremental LYs	ICER
Apixaban (Both VKA suitable and unsuitable)	USD 34,641.37	USD 1,230.68	8.54	0.28	12.22	0.30	USD 4,159.11/LY gained USD 4,329.93/ QALY gained
Aspirin(VKA unsuitable) and Warfarin(VKA suitable)	USD 33,410.69		8.26		11.92		

ICER; Incremental Cost-Effectiveness Ratio, LYs: Life years, QALYs: quality-adjusted life year; USD: United States Dollar

- The OWSA demonstrated that ICER was most sensitive to the daily cost of apixaban, followed by the monitoring visit cost (Figure 2)

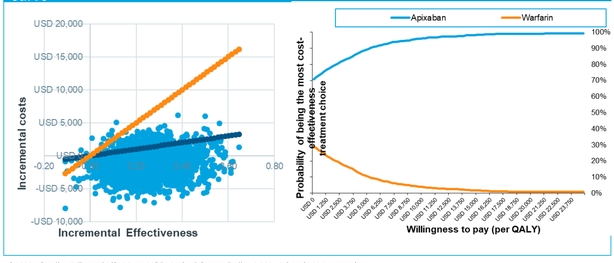
Figure 2: Tornado Plot- One Way Sensitivity Analysis



ICER; Incremental Cost-Effectiveness Ratio; MI: Myocardial Infarction ; PYs: Person Years; SE: Systemic Embolism

- For VKA suitable patients, the cost-effectiveness plane suggests that apixaban was cost-effective than Warfarin for most of the simulations (Figure 3)
- At WTP threshold of USD 5,000 and USD 25,000, the probability of Apixaban being cost effective over Warfarin was 70% and 100%, respectively (Figure 3)

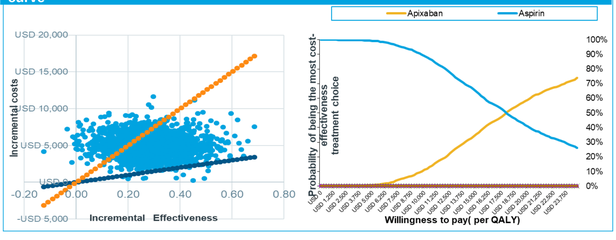
Figure 3: VKA Suitable population : Scatter plot and Cost Effectiveness acceptability curve



QALY : Quality Adjusted Life Year; USD: United States Dollar, VKA : Vitamin K Antagonist

- For VKA unsuitable patients, the cost-effectiveness plane suggests that apixaban was cost-effective than Aspirin for most of the simulations (Figure 4)
- At WTP threshold of USD 5,000 and USD 25,000, the probability of Apixaban being cost effective was 1% and 74%, respectively (Figure 4)

Figure 4: VKA unsuitable population : Scatter plot and Cost Effectiveness acceptability curve



QALY : Quality Adjusted Life Year; USD: United States Dollar, VKA : Vitamin K Antagonist

Conclusion

- The study demonstrated that the total cost of AF management per patient using Apixaban would be nearly USD 34,641 versus USD 33,411 using Aspirin for VKA unsuitable and Warfarin for VKA suitable patients, with an incremental overall cost of USD 1,231 over the lifetime horizon. This would result in gain of 0.30 LYs and 0.28 QALYs versus the use of Aspirin or Warfarin
- The ICER per QALY gained and LY gained were USD 4,329.93 and USD 4,159.11 respectively
- Apixaban is a cost-effective treatment option compared to Warfarin and Aspirin for the management of VKA suitable and unsuitable atrial fibrillation patients at a willingness to pay threshold of USD 25,000/QALY gained for the Iraqi private healthcare sector

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ISPOR 16-19 November, 2020,Virtual presentation, Milan, Italy, Europe,

Acknowledgement: The authors would like to thank all contributors for their commitment and dedication to the goals of Atrial Fibrillation. The medical writing support was provided by Kirti Kataria and Koshu Mahajan (IQVIA, India). The authors are fully responsible for all content and editorial decisions, were involved at all stages of poster development, and have approved the final version.

Disclosure: The study was sponsored by Pfizer, UAE