Cost-Effectiveness of Febuxostat 120/80 mg as a Second-Line after Allopurinol 100/300mg in Gout Patients in Algeria

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Introduction

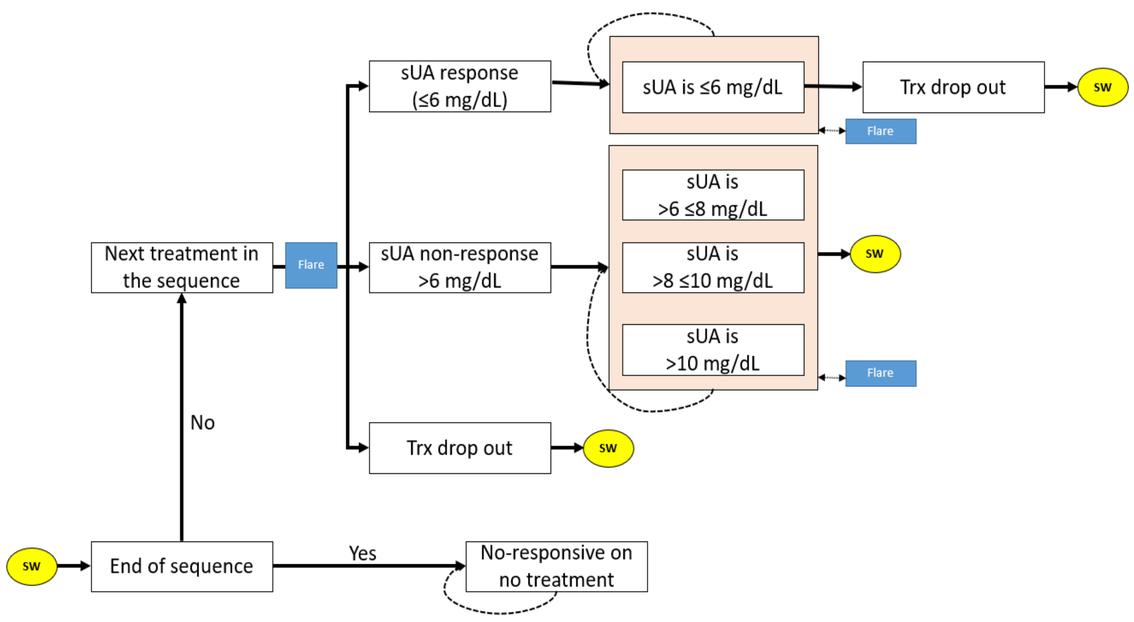
Gout is the most common form of inflammatory arthritis. Febuxostat is recommended as a second-line treatment for gout patients who failed on allopurinol treatment.

Objective

We aim to assess the Cost-Effectiveness of Febuxostat as a second-line option for gout treatment from Algerian payer perspective.

Method

A decision tree followed by a Markov model was constructed. The decision tree was used to assess the initial treatment during the first 3 month (1st cycle). The Markov model was used to assess the maintenance treatment after the first cycle.



Replicated from Beard SM, et al, Eur J Health Econ. 2014

The time horizon of the model is 5 years. Each cycle consists of 3 months. A hypothetical cohort of 1000 patients (adult ≥18 years, with gout and sUA ≥8 mg/dl) were assumed to be on three treatment sequences.

Sequence 1

Allopurinol 100/300 mg → then no treatment

Sequence 2

Allopurinol 100/300 mg → Febuxostat 80 mg → then no treatment

Sequence 3

Allopurinol 100/300 mg → Febuxostat 80 mg → Febuxostat 120 mg → then no treatment

The model reflects the serum uric acid (sUA)-defined health states, treatment pathways, acute flare events, and per-cycle transitions.

Variable	Base case estimate	Variable	Base case estimate	Variable	Base case estimate
Efficacy Probabilities		**Drop out rate**		**Number of flares within 8 weeks of prophylaxis during the first cycle**	
Allopurinol 300mg					
≤6.0 mg/dl	37.60%	0-3 months	11.90%	Allopurinol 100/300mg	0.92
Non-responders	62.40%	4-6 months	8.80%		
>6 and ≤8 mg/dl	79.00%	7-12 months	10.20%	Febuxostat 80 mg	1.12
>8 and ≤10 mg/dl	17.50%	Successive years annual	28.90%	Febuxostat 120 mg	1.55
>10 mg/dl	3.50%				
Febuxostat 80 mg				**Probability of flares after 3-months**	
≤6.0 mg/dl	73.30%	0-3 months	17.40%	≤6.0 mg/dl	8.74%
Non-responders	26.70%	4-6 months	13.90%	**Non-responders**	
>6 and ≤8 mg/dl	74.10%	7-12 months	14.50%	>6 and ≤8 mg/dl	9.89%
>8 and ≤10 mg/dl	21.30%	Successive years annual	12.20%	>8 and ≤10 mg/dl	10.85%
>10 mg/dl	4.60%			>10 mg/dl	11.61%
Febuxostat 120 mg				**Chronic kidney diseases (CKD) onset and progression**	
≤6.0 mg/dl	79.30%	0-3 months	17.70%	Incidence of CKDper 1000 person per year	0.035
Non-responders	20.70%	4-6 months	11.90%		
>6 and ≤8 mg/dl	67.20%	7-12 months	11.80%	Relative risk for onset of CKD	1.43
>8 and ≤10 mg/dl	29.50%	Successive years annual	18.20%	Relative risk for progression of CKD	1.98
>10 mg/dl	3.30%				

The ICER equation considers the incremental cost (represented in direct medical cost per patient) between sequences divided by the incremental effect (number of patients achieving sUA ≤6 mg/dl). The base case analysis and probabilistic sensitivity analysis (PSA) were used in reporting the ICER.

Result

Sequence 3 is associated with the biggest number of patients achieving the target sUA. Also, it was associated with the highest cost over 5 years.

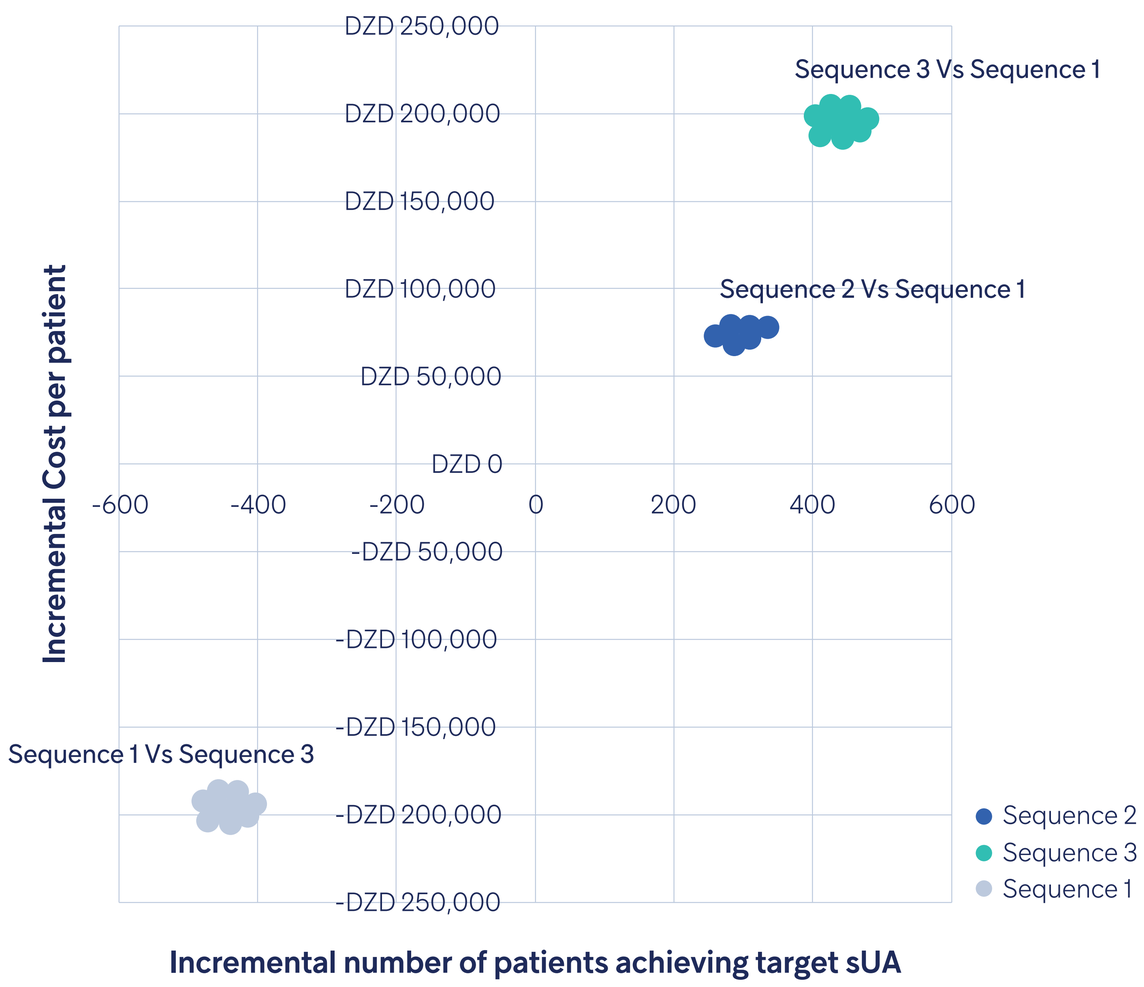
	Sequence 1	Sequence 2	Sequence 3
Number of Patients achieving the target sUA per 1000 patients	365	663	807
Total Cost per Patient	DZD 51,721	DZD 117,646	DZD 225,517

Sequence 3 was associated with higher gains in clinical and cost outcomes compared to sequence 1 and 2, at an ICER of DZD 393 and DZD 747 per one additional patient achieving sUA≤6 mg/dl, respectively.

Sequence 1		
DZD 221	**Sequence 2**	
DZD 393	DZD 747	**Sequence 3**

The base case ICERs were confirmed in the PSA.

Sequence 1		
DZD 222	**Sequence 2**	
DZD 393	DZD 748	**Sequence 3**



Univariate sensitivity analysis demonstrated that the results were robust to changes in input parameters. The model was most sensitive to changes in the cost of febuxostat 120mg.

Conclusion

In Algeria, Febuxostat 120/80 mg as a second-line treatment after allopurinol 100/300mg in gout patients is associated with improved clinical and reasonable economic outcomes compared to allopurinol 100/300mg only.

References:

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