

Efficacy of Febuxostat with Allopurinol in Chronic Kidney Disease Patients: A Comparative Study

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ABSTRACT

Aim: Efficacy of febuxostat with allopurinol in patients of chronic kidney disease

Methods: 80 subjects with chronic kidney disease, 20 to 70 years of age with both gender were included. Patients of acute kidney injuries (AKI), acute nephritis, or rapidly progressive glomerulonephritis, liver dysfunction and alcohol abuse were excluded. Group A received febuxostat 40 mg/day for 3 months. Group B patients received allopurinol 100 mg/day for 3 months. Blood samples were sent to the laboratory for serum uric acid level.

Results: The mean \pm SD age of women in group A and B was 41.8 ± 12.8 and 41.2 ± 10.8 years respectively. Out of 80 cases, 53 (66.3%) were between 20 to 40 years of age. In this study, 55 cases (68.8%) were males and 25 (31.3%) were females. M:F ratio was 2.2:1. This study showed that febuxostat is more effective in reducing uric acid as compared to allopurinol i.e. 72.5% and 45% respectively with p-value of 0.012.

Conclusion: Febuxostat is more effective in reducing uric acid as compared to allopurinol in chronic kidney disease cases.

Keywords: chronic kidney disease, serum uric acid, febuxostat.

INTRODUCTION

Worldwide, chronic kidney disease (CKD) is highly prevalent¹. It is one of the fastest growing global causes of death and will become the fifth leading global cause of death by 2040.² Prevalence of CKD in Pakistan is 12.5%.³ An increase in serum urate concentration >6.8 mg/dl is called as hyperuricemia and associated with many systemic disorders⁴. Hyperuricemia is a common complication of CKD. Data showed that it is an independent risk factor for CKD⁵.

The objective of the study was to determine efficacy of febuxostat with allopurinol in patients of chronic kidney disease.

METHODOLOGY

After approval from hospital ethical committee, cases who fulfilled the inclusion criteria were enrolled and informed consent was taken. They were divided into two groups. Group A received febuxostat 40 mg/day for 3 months and group B allopurinol 100 mg/day for 3 months. Blood samples were sent for estimation of serum uric acid level after 3 months of treatment. All the data was analyzed using SPSS Version-25.

RESULTS

The detail of results given in tables 1,2,3,4,5,6,7.

Table 1: Gender distribution .

Gender	Group A	Group B	Total
Male	28(70%)	27(67.5%)	55(68.8%)
Female	12(30%)	13(32.5%)	25(31.3%)

Table 2: Efficacy of febuxostat with allopurinol in patients of CKD

Efficacy	Group A	Group B
Yes	29(72.5%)	18(45%)
No	11(27.5%)	22(55%)

P< 0.01 which is statistically significant

Table 3: Stratification of efficacy with respect to age

Age (years)	Group A		Group B		p-value
	Yes	No	Yes	No	
20-45	19	07	11	16	0.018
46-70	10	04	07	06	0.345

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Table 4: Stratification of efficacy with respect to gender

Gender	Group A		Group B		p-value
	Yes	No	Yes	No	
Male	20	08	12	15	0.043
Female	09	03	06	07	0.141

Table 5: Stratification of efficacy with respect to duration

Duration (months)	Group A		Group B		p-value
	Yes	No	Yes	No	
≤ 24	15	06	10	10	0.160
>24	14	05	08	12	0.034

Table 6: Stratification of efficacy with respect to BMI

BMI (kg/m ²)	Group A		Group B		p-value
	Yes	No	Yes	No	
≤ 27	13	05	09	18	0.011
>27	16	06	09	14	0.023

Table 7: Stratification of efficacy with respect to stage

Stage	Group A		Group B		p-value
	Yes	No	Yes	No	
1-2	13	05	08	09	0.129
3-4	16	06	10	13	0.047

DISCUSSION

In this study, mean age of women in group A and B was 41.8 ± 12.8 and 41.2 ± 10.8 years respectively. Out of 80 cases, 53 cases (66.3%) were between 20 to 40 years of age. 55 cases (68.8%) were males and 25 (31.3%) were females with M:F ratio of 2.2:1. In this study, febuxostat is more effective in reducing uric acid than allopurinol for for 3 months i.e. 72.5% and 45% respectively (p < 0.01). In one study, efficacy of febuxostat and allopurinol for reduction of serum uric acid level after 3 months was 73.3% and 33.3% respectively⁶.

Half life of Febuxostat is 4-18 hours and mostly metabolized in liver. The half life of allopurinol is lower than febuxostat.⁷ Becker MA et al⁷ in his study also showed better results of Febuxostat (dose of 80-120 mg/day) as compared to allopurinol (dose of 300mg/day). In allopurinol users, A significant reduction was observed in uric acid (from 8.7 to 7.1mg/dl)(p<0.01)⁸.

Omori et al⁹ observed that febuxostat decreased the damage of renal tubules thus preventing the damage of endotheliocyte. So febuxostat has dual action i.e. reducing uric acid and to prevent renal damage in CKD patients¹⁰.

Sakai et al¹¹ reported that the cases who did not respond to allopurinol were better treated with febuxostat for reducing uric

acid. Tsuruta et al¹² observed in 73 patients with hyperuricemia and concluded that decreased eGFR was slow in cases febuxostat therapy than allopurinol¹³.

CONCLUSION

Febuxostat is more effective in reducing uric acid as compared to allopurinol in chronic kidney disease cases.

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