

The Effect of Serum Uric Levels on Hemodialysis Efficacy Among Population in Saudi Arabia



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BACKGROUND

Chronic kidney disease (CKD) is a serious medical and social issue as its incidence is rising at an alarming rate in Saudi Arabia and Worldwide [1][2]. Renal replacement therapy with hemodialysis has become the mainstay of treatment for patients with end stage renal dysfunction. Yearly death among these patients ranges between 15% and 25% [3, 4]. It is believed that insufficiency of dialysis is linked with morbidity and death in chronic HD patients [5]. Improvement of dialysis efficiency leads to decreased organ toxicity as the vital organs are commonly less exposed to toxicity and decreasing the severity of systemic damage is but a corollary [6]. Therefore, many studies have proposed various methods and procedures to optimize the performance of HD [7,8,9,10, 11]. Unfortunately, most of the proposed methods and techniques have not fully optimized HD [12]. Therefore, focus must shift toward other factors that may affect HD a patients.

In recent years, more attention is paid for UA as a risk factor for kidney impairment patients. UA is associated with hypertension, coronary heart disease and chronic kidney disease [13]. In addition, high UA also could independently predict CV events and mortality for patients with chronic diseases including CKD [14]. Although hyperuricemia is common in patients with chronic kidney disease, the impact of uric acid on HD adequacy remains unclear.

OBJECTIVES

Our aim was to investigate the effect of UA levels on HD efficacy (in terms of some CKD parameters such as creatinine, and urea) in patients of different age groups in Hail region of Saudi Arabia

MATERIALS AND METHODS

This study was conducted on the outcome of dialysis study, which is a retrospective study as 255 blood samples were obtained from Saudi individuals in region of Hail with a history of chronic kidney failure. Informed consent was obtained from all patients prior to inclusion in this study. The samples were analyzed for kidney function test and uric acid. The protocol was approved by the Ethics committee of University of Hail. Biochemistry data including kidney function test of creatinine and urea beside the UA were examined using an automatic Hitachi chemistry analyzer.

Conclusion

Based upon the findings of this study, it may be concluded that uric acid lowering drugs can increase HD efficiency in subjects, particularly in the < 50 years of age.

RESULT

Table 1. Demographic Characteristics of Patientsa

	Percent	
Age (M ± SD)	50.09 ± 18.07	
Range	25 - 83	
median	51	
Number	255	100
M/F	102/153	40/60*
Diabetic/Non	129/126	51/49
Diabetic (type I/ type II)	105/24	41/11
Hypertensive/Non	219/36	86/14*

* Significant

Fig. Kidney function parameters- Comparison of pre- and post-dialysis blood concentrations.

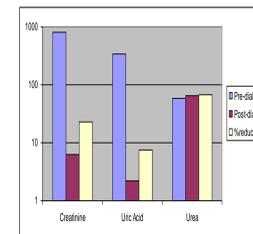


Table 2. Kidney function parameters- Comparison of pre- and post-dialysis blood concentrations in patients of different age groups.

	< 50 yrs (n= 102)			> 50 yrs (n= 135)		
	Pre	Post	% reduction	Pre	Post	% reduction
Creatinine	893.8 ± 240.9#*	400.3 ± 161.9*	55.54 ± 10.53*	708.4 ± 238.4#	283.9 ± 112.2	59.46 ± 8.92
Uric acid	6.55 ± 1.67#*	2.64 ± 1.31*	58.42 ± 23.5*	5.92 ± 1.29#	1.85 ± 0.90	69.22 ± 11.41
Urea	22.72 ± 7.85#	8.14 ± 4.1*	64.13 ± 12.35*	22.95 ± 9.74#	6.99 ± 3.86	1.9.92

*Significant with respect to post-dialysis
Significant with respect to the non-diabetic

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Summery

Background: The high prevalence of morbidity and mortality observed in patients with end stage renal disease (ESRD) is mainly attributed to inadequacy of hemodialysis (HD). The proposed approaches that have been used to optimize HD performance are not fully successful. Part of this frustrating situation may be attributed to poor understanding of the factors affecting the HD process, including patient's serum uric levels (UA). In the current study we aimed to assess the relationship between serum UA levels and hemodialysis efficiency among ESRD patients in Hail, Saudi Arabia.

Methods: A total of 255 hemodialysis patients (102 males and 153 females) were enrolled in this retrospective study. The range was 25 to 83 years with median age of 51 years. Blood samples drawn from patients before and after the hemodialysis session were analyzed for urea, creatinine, and uric acid.

Results: We found that the proportion of female patients with ESRD was significantly higher (60 %; p<0.05), than the males in the patient group examined. Among hemodialysis patients, the incidence of hypertension was 86 % (p<0.05). There was a negative association between UA and HD efficiency in patients aged less than 50 years. In addition, a significant correlation was observed between levels of UA and urea (r=0.579 p <0.001) and creatinine (r=0.736 p <0.001).

Conclusions: Taken together, the results of this study indicate that the hemodialysis efficiency in HD subjects, particularly in the < 50 years of age may be improved by lowering the serum uric levels.

Key words: Hail, Saudi Arabia, Uric Acid, Hemodialysis Efficacy, End Stage Renal Disease (ESRD)

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