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RESEARCH ARTICLE
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Effects of N-acetylcysteine on Serum Creatinine Levels in Chronic Renal Impairment Patients

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ABSTRACT

Background information and goals: N-acetylcysteine (NAC), an amino acid, has been used for a long time as a protection against contrast-induced nephropathy (CIN). NAC's efficacy is questionable due to conflicting study results and signs that it can alter blood creatinine levels without influencing the glomerular filtration rate. However, the impact of N-acetylcysteine on blood creatinine following therapy with current NAC preventive dosages has not been examined in a population at risk for CIN.

Keywords: *Chronic, Serum, Patients, Impairment*

INTRODUCTION

N-acetyl cysteine (NAC) has been commercially available for a long time as a safe and inexpensive medicine 1. Cysteine is found in a variety of foods, including “chicken and turkey meats, garlic, yogurt, and eggs” not found in natural sources 2. NAC is a mucolytic medication that reduces sticky mucus discharges while also increasing glutathione S-transferase activity 3.

NAC undergoes a deacetylation process when going via the liver and small intestine during oral treatment, lowering its bioavailability to 4-10%. NAC enhances glutathione production, detoxification, and functions as a direct free radical scavenger 4. It's a potent antioxidant that could be used to treat ailments caused by the production of free oxygen radicals 5. NAC therapy has been established in studies to have no negative effects on the mother or the fetus 6. Sulphydryl groups are abundant in this nutritional supplement 7. By boosting intracellular glutathione levels and lowering mitochondrial membrane depolarization, NAC protects endothelial cells from apoptosis and oxygen-related genotoxicity 8. Because of NAC is known for its role as a precursor to glutathione, one of the most significant antioxidants found in nature has significant antioxidant properties 9. The use of NAC in reactive oxygen species are reduced when vitamin E, or vitamins A+E, are combined with important fatty acids (ROS) and improves pregnancy rates 10. According to studies, NAC's ability to protect against chemical toxicity is owing due to its dual role as a nucleophile and a donor of -SH 11. The use of NAC in the treatment of a variety of illnesses is highlighted in this study, which is based on a review of the literature.

Hcy (homocysteine) is a sulphur-containing amino acid produced by the human body's metabolism of the amino acid methionine 12. Hcy levels in hemodialysis patients have been linked to kidney problems 13. However, several investigations have demonstrated that NAC treatment can Hcy levels in plasma in hemodialysis patients can be influenced. According to several findings, NAC, which has antioxidant properties, has reduced Plasma Hcy levels in hemodialysis patients with end-stage renal disease (ESRD). Although a lower dose of NAC (for example, 600 mg/day for a month) did not assist these patients to lower their Hcy plasma levels, higher doses (for example, 1000 mg/day for a month) did 14.

There is evidence that the amino acid N-acetylcysteine (NAC) can prevent damage to the kidneys caused by toxins, ischemia, and contrast media. All of these studies use changes in blood creatinine concentration as a proxy marker of glomerular filtration rate (GFR), the actual metric by which kidney function is assessed. To learn how NAC achieves its beneficial effects, we need to know whether or whether it can alter serum creatinine levels independently of GFR. It has been established that blood creatinine levels can "Normal blood pressure: 120/80 mm Hg";

"Elevated blood pressure: 120- and 129/80-mm Hg";

"Stage 1 HTN: 130 and 139/80- and 89-mm Hg";

"Stage 2 HTN: BP 140/90 mm Hg"

Twenty more patients were enrolled to help researchers understand the normal ranges for the study's parameters and evaluate the efficacy of the treatment in bringing the study's abnormal results back into the norm.

Patients: 25 were given dietary management and lifestyle changes for 12 weeks, and another 25 were given Q10 (200mg) for 12 weeks, in addition to the aforementioned.

Measurement of Serum Creatinine

Serum cretonne according to the method of evaluation, a ready-made kit was used for this purpose (Henry et al; 1984), cretonne produces a colorful complex in a basic picrate solution, with a light absorbance of 492 nm.

be reduced by NAC in healthy individuals with normal renal function. Although blood creatinine levels dropped, there was no corresponding drop in serum cystatin C levels. This suggests an outcome. without respect to changes in GFR, such as an increase or decrease in creatinine tubular secretion output 15.

Aim of the study

to see how N-acetyl cysteine (NAC) affects the immune system on serum creatinine levels in chronic renal impairment patients

METHODS

Study design

The current study involved 50 people persons have Stage 1 HTN: BP ≥130 and ≤139/≥80 and ≤89 mm Hg (30males, 20 females) Al-Sader Teaching Hospital saw people ranging in age from 30 to 65. Pre-hypertension was detected clinically by the doctors. Prehypertension diagnosis criteria based on the 2017 American College of Cardiology/American Heart Association recommendations for various stages of HTN".

RESULTS

Demographic characteristics

There were 119 people with prehypertension who participated in the research; 64 men and 55 women. Their ages varied widely, from 30 to 61, with women averaging 43.4 6.96 years and men 41.5 10.75 years on average.

Comparison of patients with chronic renal impairment and healthy subjects with respect to different parameters

The following table 3-1 displays the mean SD for creatinine in the apparently healthy and inpatients groups. Using an unpaired t-test, we compared the baseline characteristics of the healthy and ill and found significant differences in creatinine(p0.001) between the patients with

chronic renal impairment and the control group.
see Table 3-1.

TABLE 3-1: "Comparison of study parameters of chronic renal impairment patients to that of healthy subjects" baseline

"Parameters"	**"Patients"**	**"Healthy"**	**"P. value"**
	"mean ±SD"	**"mean±SD"**	
Creatininemg/dl	2.058±0.051	0.842±0.041	.001

Effect of study treatment on (creatinine)
Creatinine levels in the N-acetyl cysteine group decreased significantly after 12 weeks compared to baseline (P0.001). At the end of the 12-week trial period, the N-acetylcysteine group had significantly lower levels of creatinine than the control group (P<0.05). consistent with what we see in Table 3-2.

TABLE 3-2: "Effect of study treatment on (creatinine) after 12-week treatment in the study group and multiple comparisons of the change from baseline"

"Group" / **"parameters"**		**"Control"**		**"creatinine"**	
		"Mean"	**"±SD"**	**"mean"**	**"±SD"**
N-acetyl cysteine	Baseline	1.912	0.043	2.14	0.035
	12week	1.781*	0.033	1.43**	0.032
	Δcreatinin e	-0.131	0.01	-0.71[a]	0.003

*="statistically significant (P<0.05) difference after 12 weeks compared with the baseline by using paired t-test".
**= "statistically highly significant (P<0.001) difference after 12 weeks compared with the baseline by using paired t-test".
"a= statistically significant (P<0.05)difference after 12 weeks compared with acontrol group using ANOVA post hoc test or unpaired t-test".

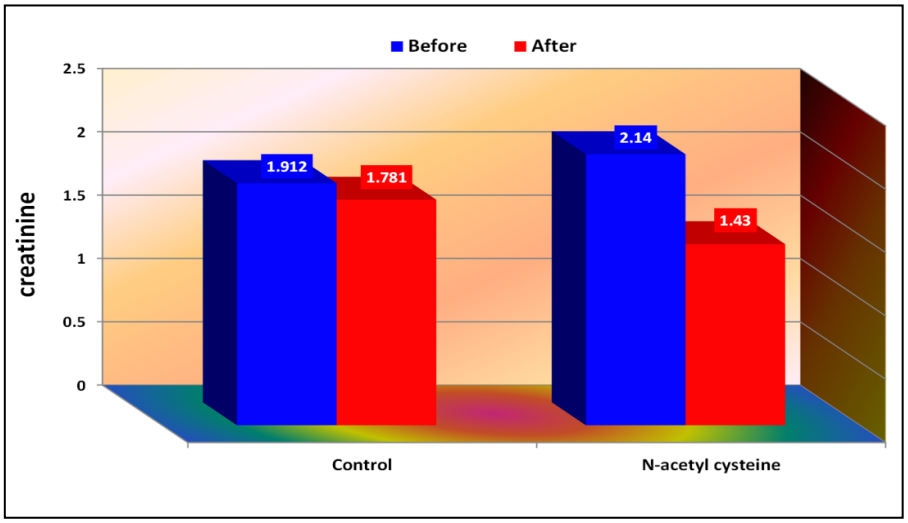

FIGURE 3-1: "Creatinine before and after 12 weeks of the study treatment"

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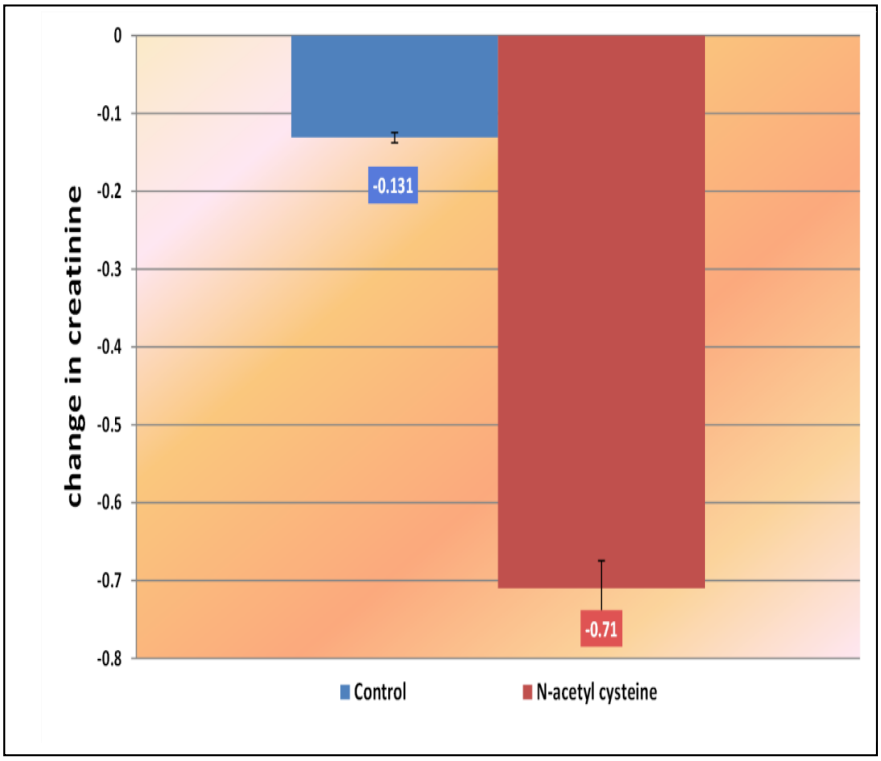

FIGURE 3-2: "Changes in creatinine from the baseline to 12 weeks of the study treatment"

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