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CARDIOMYOPATHY;
EFFECT OF LIMITING SALT & WATER INTAKE ON PERIPHERAL EDEMA IN PATIENTS

Ammar Asghar[1], Aneeqa Ilyas[2], Tuba Jamil[3], Umair Asghar[4]

1. MBBS
   House Officer
   Department of Medicine
   Services Hospital Lahore
2. FCPS (Medicine)
   Assistant Professor of Medicine
   Department of East Medical Ward
   KEMU, Mayo Hospital Lahore.
3. MBBS
   House Officer
   Department of Surgery
   Services Hospital Lahore.
4. MBBS
   Postgraduate Resident of
   FCPS Cardiology
   Punjab Institute of Cardiology,
   Lahore.

Correspondence Address:
Dr. Umair Asghar
Allied Homes,
House No C-468-E,
Main Eden Cottage Road,
Near Iqbal Park, DHA Phase 03,
Defense Lahore.
umairasghar51@yahoo.com

ABSTRACT… Background: Peripheral edema is associated with cardiomyopathy. It is commonly observed in patients of heart diseases. It is known that restriction of sodium products can reduce edema. So it was planned to conduct the study and find the effectiveness of salt and water restriction in cardiomyopathy patients having peripheral edema. **Objectives:** To compare the peripheral edema by restricting salt and water consumption in patients with cardiomyopathy. **Study Design:** Randomized control trial. **Setting:** Department of Cardiology, Punjab Institute of Cardiology, Lahore. **Duration:** Six months. **Methodology:** 50 cases of cardiomyopathy with peripheral edema were randomly divided in 2 groups. In group A, patients were instructed to reduce salt and water intake per day and in group B, no water and salt restriction was instructed. All patients were followed-up in OPD for 15 days. Then patients were assessed for peripheral edema. Chi square test was applied to compare the frequency of peripheral edema in both groups. P-value<0.05 was considered as significant. Results: The mean age of the patients was 46.00±12.98 years. There were 48% males and 52% females. Mean duration of cardiomyopathy was 5.56±2.98 years. The mean reduction in salt intake was 0.57±0.22 grams in experimental group and 0.42±0.21 grams in control group (P<0.05). The mean reduction in water intake was 0.72L in experimental group and 0.53L in control group (P<0.05). Peripheral edema was found in 8% in experimental group and 44% in control group (P<0.05). **Conclusion:** Our study results concluded that salt and water restriction can reduce peripheral edema in patients with cardiomyopathy and thus improve condition of patient.

Key words: Cardiomyopathy, Salt, Water, Restriction, Peripheral Edema.

INTRODUCTION

The cardiac cause of edema was found in 23% patients.[1] Blood pressure associated ailments, particularly cerebrovascular accidents, coronary artery disease, heart failure, and renal diseases, play important role in increasing morbidity and mortality throughout the world.[2] Worldwide, hypertension is reported in 54% of patients with cerebrovascular accidents while 47% of cases with coronary heart attacks.[3]

There may be two main factors, which if in control, then the chances of hypertension and hypertension related morbidity and mortality can be reduced. These are: BP <120/80mmHg and sodium intake<1500mg/dl. The aim of this recommendation has 2 key features: first is to highlight the remarkable evidence that associate

sodium consumption with high blood pressure and other adverse consequences, & second is to assist as a call to action on behalf of American Heart Association for public, general practitioners, health departments, governments and industry to state this foremost public health problem.[4]

Salt is major component of food. Sodium, commonly consumed in table salt (sodium chloride). However, it is also consumed in non-chloride forms like sodium bicarbonate and monosodium glutamate. Salt provides about 90% of dietary sodium which a normal person consumes every.[4] Limited salt and water consumption can have a significant improvement in a cardiac health of cardiac patients. Salt & water limitation are suggested for patients with heart diseases in international guidelines.[5,6] But

very few work has been done in restricting salt and water intake in patients of cardiomyopathy with peripheral edema. So we conducted this study to get the evidence whether restriction of salt and water intake can be helpful in reducing edema and improving patients' condition.

OBJECTIVE
To compare the peripheral edema by restricting salt and water consumption in patients with cardiomyopathy.

MATERIAL AND METHODS
Study Design
Randomized Controlled trial.

Setting
Cardiology department, Punjab Institute of Cardiology, Lahore.

Study Duration
6 months.

Sample Size
50cases with 95%confidence level, 12%margin of error and taking percentage of peripheral edema i.e. 23% in cases of cardiomyopathy.

Sampling Technique
Non-probability, consecutive sampling.

Selection Criteria
Patients aged 30 – 80 years of either gender with cardiomyopathy and peripheral edema. Patients with valvular heart disease, or valvular replacement, patients already had restriction to salt and water were not included.

Data Collection Procedure
50 patients fulfilling the inclusion criteria were selected. Informed consent was obtained. Demographic information was also be obtained. Then patients were randomly divided in two group by using bingo method. In group A, patients were instructed to reduce salt and water intake per day and in group B, no water and salt restriction was instructed. All patients were followed-up in OPD for 15 days. Then patients were assessed for peripheral edema.

Statistical Analysis
The collected information was analyzed through SPSS 21. Chi square test was applied to compare the frequency of peripheral edema in both groups. P-value<0.05 was considered as significant.

RESULTS
The mean age of patients was 45.76±13.29 years in experimental group and 46.24±12.93 years in control group. In the trial, there were 14 males and 11 females were randomized to experimental group and 10 males and 15 females were randomized to control group. In experimental group, patients had 6.24±2.77 years of cardiomyopathy while 4.88±3.09 years in control group. In experimental group, 18(72%) patients had previous MI and in control group, 10(40%) patients had previous MI. In experimental group, 12(48%) patients had diabetes and in control group, 12(48%) patients had diabetes. (Table-I)

At baseline, salt intake was 6.48±1.58g in experimental group and 6.22±1.60g in control group. After 15 days, salt intake was 2.70±1.32g in experimental cases while 3.50±1.30g in control cases. The difference was calculated as significant (p=0.035). There was 0.57±0.22g reduction in salt intake in experimental cases while 0.42±0.21g reduction in control cases. The difference was calculated as significant (p=0.015). At baseline, water intake was 4.08±1.25L in experimental cases and 3.72±1.34L in control cases. After 15 days, water intake was 1.06±0.44L in experimental cases while 1.76±1.02L in control cases. The difference was calculated as significant (p=0.003). There was 0.72±0.13L reduction in water intake in experimental cases while 0.53±0.21L reduction in control cases. The difference was calculated as significant (p=0.000). (Table-II)

In experimental group, there were 2(8.0%) who had peripheral edema while 23(92%) patients resolved the peripheral edema. In control group, there were 11(44%) who had peripheral edema while 14(56%) patients resolved the peripheral edema. The difference between both groups was calculated as significant (p=0.004). (Table-III)

	Study group	
	Experimental	Control
n	25	25
Age (Years)	45.76±13.29	46.24±12.93
Gender (m/f)	14/11	10/15
Years of cardiomyopathy	6.24±2.77	4.88±3.09
Previous MI	18(72%)	10(40%)
Diabetes	12(48%)	12(48%)
Table-I. Characteristics of patients		

		Study Group		p-value
		Experimental	Control	
Salt intake	Baseline	6.48±1.58	6.22±1.60	0.567
	After 15days	2.70±1.32	3.50±1.30	0.035
	Reduction	0.57±0.22*	0.42±0.21	0.015
Water intake	Baseline	4.08±1.25	3.72±1.34	0.330
	After 15days	1.06±0.44	1.76±1.02	0.003
	Reduction	0.72±0.13*	0.53±0.21	0.000
Table-II. Comparison of salt and water output in both study groups *** = p=0.000 (Paired sample t-test, significant reduction in both groups)**				

Peripheral edema	Group		Total
	Experimental	Control	
Yes	2(8.0%)	11(44%)	13(26%)
No	23(92%)	14(56%)	37(74%)
Total	25	25	50
Table-III. Comparison of peripheral edema in both groups after treatment ***p = 0.004 (Significant)**			

DISCUSSION

In our study, the mean age of patients was 45.76±13.29 years in experimental group and 46.24±12.93 years in control group. There were 14 males and 11females were randomized to experimental group while 10males and 15 females were randomized to control group. In experimental group, patients had 6.24±2.77 years of cardiomyopathy while 4.88±3.09 years in control group. In experimental group, 18(72%) patients had previous MI and in control group, 10(40%) patients had previous MI. In experimental group, 12(48%) patients had diabetes and in control group, 12(48%) patients had diabetes.

At baseline, salt intake was 6.48±1.58g which was reduced to 2.70±1.32g in experimental group, while in control group, salt intake was 6.22±1.60g which was reduced to 3.50±1.30g. The difference was significant (p<0.005). Thus there was more reduction of salt intake in experimental group (0.57±0.22g) as compared to control group (0.42±0.21g, p=0.015). At baseline, water intake was 4.08±1.25L which was reduced to 1.06±0.44L in experimental group and in control group 3.72±1.34L which was reduced to 1.76±1.02L. The difference was significant (p<0.05). Thus there was more reduction in water intake in experimental group (0.72±0.13L) as compared to control group (0.53±0.21L). The difference was significant (p=0.000).

In a study Colin Ramirez and co-workerslimited the salt and water intake but with a more complicated diet and found that reduced consumption of salt and fluid and less urinary sodium excretion cause less frequent edema & weakness and improved the condition and quality of life of cardiac patient.[7] These results were consistent with findings of Philipson study i.e. if salt and fluid intake are not controlled, and urinary sodium excretion is high, it would makes it difficult to estimate adherence

to dietary restrictions.[8] For so long, fluid limitation of 1.5L daily was recommended for cardiac patients in international guidelines.[9,10] Very limited randomized trials have been done in which fluid restriction in cardiac patients was done. Like, one trial compared one group of fluid-restriction (1L/day) with that of no fluid intake restriction, it showed that insignificant differences present in both groups regarding condition and quality of life of patient. Thus, it was concluded that restricting fluid intake has no clinical advantage in such cases.[11]

In another retrial, Holst et al., compared two different regimens i.e. liberal fluid intake (30–35mL/kg/day) and restricted fluid intake (1.5L/days). But there was insignificant difference in both groups regarding body weight, clinical condition, quality of life and or working.[12] But, patients who had liberal fluid had less thirst complaints.[13] In another trial, it was evaluated that if limited sodium and water is taken, whether it would improve condition of cardiac patients. Patients in experimental group were advised to take sodium (2–3g/day) while water (1.5L/day) but controls had routine diet plan. Water intake was decreased in experimental group than control group: 1.6±0.4L to 1.2±0.5L vs. 1.7±0.8L to 1.6±0.9L (p=0.04). Consequently, cardiac patients were capable of controlling sodium and water consumption.[14] In our study, with salt and water restriction, peripheral edema was resolved in 23(92%) patients while in 14(56%) as compared to normal diet group (control group). The difference between both groups was found to be significant (p=0.004).

CONCLUSION

Results of our study concluded that salt and water restriction can reduce peripheral edema in patients with cardiomyopathy and thus improve condition of patient. It is now recommended that salt and water restriction will be advised to cardiomyopathy patients to prevent and control peripheral edema and improve patient condition. **Copyright© 15 Dec, 2017.**

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Ammar Asghar	Writing of manuscript	
2	Aneeqa Ilyas	Guidelines in writing	
3	Tuba Jamil	Compliance of results + Proofreading	
4	Umair Asghar	Electrical Analysis	