A Study to Assess the Effect of Selected Nursing Interventions on Leg Cramps for Patients Undergoing Hemodialysis in Selected Hospitals

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ABSTRACT

Dialysis is a process in which waste materials in the blood are filtered through a semi-permeable membrane and removed from body. With improving outcomes, replacement of renal function by Hemodialysis is a well established therapy, but it is not free from complications and those are nausea, vomiting and leg cramps. The aim of this study was to assess the effectiveness if nursing interventions such as stretching exercise, cycling exercise followed by leg massage on leg cramps on patients with renal failure undergoing Hemodialysis treatment.

Methods: A Descriptive evaluative research approach was used for the present study. Pre experimental one group pre and post test research design was used for present study. The conceptual framework is based on Ida Orlando's Nursing Process. The study comprised of 30 chronic renal failure patients admitted in selected hospital. Non probability purposive sampling technique was used for sample selection. A numerical analogous scale and Pain Scale, a standardized research tool was used for data collection. Formal permission was obtained from concerned authority from selected Hospital for data collection.

Results: The results showed that, 43.3% of patients in the age group of 30-40 years and 73.3 % of patients were male. Maximum 53.3% of patient's weight is above 56 kg. Mostly 70 % of patients need more than 30 dialysis in a month. 53.3% of renal failure patients had actual value of creatinine level as 4 to 6.9 mgdl, 43.3% of them had actual value of calcium level below 4.5 mEq/L, Majority of 80% of them had actual value of potassium level below 5.5 mEq/L and 63.3% of them had actual value of sodium level in the range 135-145 mEq/L. 36.7 % of patients had severe leg cramps. After implementing nursing intervention statistically significant difference found in post test. There was not significant association found with selected demographic variable except age among Cerebrovascular accident patients.

Conclusion: The study result shows that most of the patients were male in the age group of 30-40 years. 36.7% of patients were having severe leg cramps. After implementation of nursing care intervention leg cramps, involuntary movement and muscle contraction significantly reduced. This indicates that, there is effectiveness of nursing care intervention on leg cramps, involuntary movement and muscle contraction.

Keywords: Leg Cramps, Hemodialysis, Involuntary Movement, Muscle Contraction

INTRODUCTION

Dialysis is a process of separating solutes in a solution by diffusion across a semi-permeable membrane and can be used to restore appropriate solute balance to a patient whose kidneys are not functioning[1].

In India, it is reported that the progression of chronic kidney disease (CKD) to end stage renal disease (ESRD) is rapid due to the factors such as lack of medical facilities, poor control of risk factors and delayed referral to nephrologists. The prevalence of CKD and ESRD are estimated as 7852 and 1870 per million, respectively. It is estimated that in India about 1 00 000 person suffering from ESRD

each year, of which only about 20 000 get treated and the projected number of deaths due to chronic disease was around 5.21 million in 2008 and is expected to rise to 7.63 million in 2020 (66.7% of all deaths) [1].

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The record of 240 patients above 18 years were reviewed, 18.3% develop complication during initiation of dialysis and hypotension, headache and muscle cramps are most frequent complications noted. [3]

A Study was conducted on 103 patients in India, for transient acute neurological complication arising in the course of Hemodialysis, and found that 96% patients showed the features of leg cramps, headache ,nausea and vomiting and about 34% patients showed the features of convulsion, consciousness disturbances and psychomotor agitation [4].

A study was conducted by Holley to find the prevalence of restless legs syndrome (RLS) in Hemodialysis patients. It was found that there was 46% of prevalence of RLS. Diagnosis of RLS confirmed by using a questionnaire [5].

A study was conducted on demonstration of cycling exercise during dialysis enhances the anabolic effects and reduction in leg cramps. Exercise for 15 min initiated 15 min after starting of the dialysis session resulted in the increased uptake of amino acids and net muscle protein and lowering the muscle spasm [6].

Campbell conducted study on patients undergoing Hemodialysis therapy. The discomfort which occurs during the Hemodialysis is associated with rapid reduction of blood urea levels and consists of nausea, vomiting, headache and leg cramps [7].

A study conducted by Andrew RD on Hemodialysis patients and found that Hemodialysis causes reduction in plasma osmolarity and cause of that is swelling of brain cells and shrinking the extra cellular spaces around them. It is during this time that susceptibility to generalized tonic-clonic seizure dramatically increases and causes sudden leg tremors, involuntary leg movements and spasm in legs [8].

Problem statement:

"A study to assess the effect of selected nursing interventions on leg cramps for patients undergoing Hemodialysis in selected hospitals".

Objectives:

- To determine the leg cramps on patients undergoing Hemodialysis.
- To evaluate the effect of nursing care on leg cramps on patient undergoing Hemodialysis.
- To co-relate leg cramps of patients undergoing Hemodialysis with selected demographic variables.

MATERIAL AND METHODS

A Descriptive Evaluative research study approach was used for present study. The conceptual framework is based on Ida Orlando's Nursing Process. The research design used was pre experimental research design. The study comprises of 30 Chronic Renal Failure patients admitted in selected Hospitals. Non probability purposive sampling technique was used to select sample. The 30 chronic renal failure patients selected for the study those who are fulfilling inclusive criteria of the study. Numerical Analogous Scale and Pain Scale, a standardized research tool was used for data collection. The reliability of research tool is 0.83 which was reliable. The

investigators introduce him and obtain consent from chronic renal failure patients admitted in selected hospitals and who are willing to participate.

RESULTS

Analysis and interpretation is based on the objectives of the study. The analysis was done with the help of inferential and descriptive statistics. Frequency and percentage wise distribution of demographic variables of renal failure patients such as age, gender and so on

Table 1: Percentage wise distribution of patients according to their demographic characteristics   n=30

Demographic variable	Frequency	Percentages
Age		
10-20 years	0	0.0%
20-30 years	8	26.7%
30-40 years	13	43.3%
40 and above	9	30.0%
Gender		
Male	22	73.3%
Female	8	26.7%
Weight		
Up to 35 kg	0	0.0%
35 to 45 kg	3	10.0%
46 to 55 kg	11	36.7%
Above 56 kg.	16	53.3%
Monthly income		
Below 5000 rupees	4	13.3%
5,000 to 10,000 rupees	23	76.7%
10,000-20,000 rupees	3	10.0%
20,000 Rupees and above	0	0.0%
Number of dialysis		
1st -10th	0	0.0%
11th -20th	5	16.7%
21st -30th	4	13.3%
31st – and above	21	70.0%
Duration of dialysis		
1-6 months	18	60.0%
7-12 months	6	20.0%
13-18 months	6	20.0%
19 months and more	0	0.0%

The above table 1 shows that 43.3% of patients in the age group of 30-40 years and 73.3 % of patients were male. Maximum 53.3% of patient's weight is above 56 kg. Mostly 70 % of patients need more than 30 dialysis in a month. 76.7% of samples belongs to poor income group i.e 5000 – 10000 rupees per month income.

The below table 2 depicts that, 53.3% of samples had actual value of creatinine level as 4 to 6.9 mgdl. Majority of 80% of samples had actual value of potassium level below 5.5 mEq/L. 63.3% of

samples had actual value of sodium level in the range 135-145 mEq/L. 43.3% of them had actual value of calcium level below 4.5 mEq/L.

Table 2: Description of samples (Patients undergoing Hemodialysis) according to Clinical profile by frequency and percentage. n=30

Clinical variable	Frequency	Percentages
The actual value of Creatinine level is		
Below 1 mgdl	0	0.0%
1.1 to 3.9 mgdl	0	0.0%
4 to 6.9 mgdl	16	53.3%
7 mgdl and above	14	46.7%
The actual value Potassium level is		
Below 5.5 mEq/L	24	80.0%
5.6 to 6.5 mEq/L	5	16.7%
6.6 to 7.5 mEq/L	1	3.3%
7.6 mEq/L and above	0	0.0%
The actual value of Sodium level is		
Below 135 mEq/L	2	6.7%
135 to 145 mEq/L	19	63.3%
146 to 155 mEq/L	9	30.0%
156 mEq/L and above	0	0.0%
The actual value of calcium level is		
Below 4.5 mEq/L	13	43.3%
4.6 to 5.5 mEq/L	6	20.0%
5.6 to 6.5 mEq/L	5	16.7%
6.6 mEq/L and above	6	20.0%
The actual level of Blood urea nitrogen is		
Below 7 mg/dl	0	0.0%
8 to 14 mg/dl	0	0.0%
15 to 20 mg /dl	0	0.0%
21mg/dl and above	30	100.0%

Table 3: Leg cramps on patients undergoing Hemodialysis. n=30

Leg cramp	Frequency	Percentage
Mild (Score 1-13)	0	0.0%
Moderate (Score 14-27)	19	63.3%
Severe (Score 28-40)	11	36.7%

The above table 3 depicts that, majority of 63.3% of the patients undergoing Hemodialysis had moderate leg cramps and 36.7% of them had severe leg cramps.

Table 4: Significance of difference between involuntary movement before and after Nursing Intervention.   n=30

	Mean	SD	t test	p-value
Pretest	6.0	1.2	19.3	0.000
Posttest	2.3	1.0		S

(S=Significant)

The above table 4 shows that, difference between average involuntary movement before and after nursing care on leg cramps of patients undergoing Hemodialysis. Since p-value is less than 0.05 (p-value = 0.000) null hypothesis was rejected. The above data gives sufficient evidence to conclude that the average involuntary movement of

the patients undergoing Hemodialysis reduced significantly after nursing care. It was concluded that, nursing care is proved to be effective in reducing the involuntary movement of the patients undergoing Hemodialysis.

Table 5: Significance of difference between Muscle contraction before and after Nursing Intervention n=30

	Mean	SD	t test	p-value
Pretest	8.1	0.7	27.7	0.000
Posttest	2.1	1.0		S

(S=Significant)

The above table 5 shows that, difference between muscle contraction before and after nursing care on leg cramps of patients undergoing Hemodialysis. Since calculated t value was 27.7, it was more than t table value. Hence hypothesis was accepted. The above data gives sufficient evidence to conclude that the muscle contraction of the patients undergoing Hemodialysis reduced significantly after nursing care. It was concluded that, nursing care is proved to be effective in reducing the muscle contraction of the patients undergoing Hemodialysis.

Table 6: Significance of difference between visible tremors before and after Nursing Intervention n=30

	Mean	SD	t test	p-value
Pretest	4.8	0.9	17.6	0.000
Posttest	1.6	0.6		S

(S=Significant)

The above table 6 shows that, difference between visible tremors before and after nursing care on leg cramps of patients undergoing Hemodialysis. Since calculated t value was 17.6, it was more than t table value. Hence hypothesis was accepted. It was concluded that, nursing care is proved to be effective in reducing the visible tremors of the patients undergoing Hemodialysis.

Table 7: Significance of difference between Pain before and after Nursing Intervention n=30

	Mean	SD	t test	p-value
Pretest	8.0	0.6	41.8	0.000
Posttest	1.8	0.8		S

(S=Significant)

The above table 7 shows that, difference between Pain before and after nursing care on leg cramps of patients undergoing Hemodialysis. Since calculated t value was 41.8, it was more than t table value. Hence hypothesis was accepted. It was concluded that, nursing care is proved to be effective in reducing the pain of the patients undergoing Hemodialysis

DISCUSSION

The emotion reaction not only occur following the breaking of news of renal failure, but recur with every new crisis like treatment initiation, recurrence of symptoms, complications of the hemodialysis treatment like severe leg cramps during the Hemodialysis sessions and further neurological complications.

In present Study, more than half 53.3% had actual value of creatinine level as 4 to 6.9 mgdl, 43.3% of them had actual value of calcium level below 4.5 mEq/L. Majority of 80% of them had actual value of potassium level below 5.5 mEq/L. Majority of 63.3% of them had actual value of sodium level in the range 135-145 mEq/L.

The investigator has used paired t test for the comparing of the pre and post test score of the leg cramps after the interventions like stretching exercise, cycling exercise and leg massage provided for the patients with renal failure undergoing the Hemodialysis treatment. The pre test score mean of involuntary movement was found 6 and that of post test was 2.3,for the visible tremors pre test score was 4.8 and that of post test was 1.8.The pre test score mean for the pain was found 8 and that of the post test was 1.8 and for the muscle contraction pre test score mean was found 8.1 and that of post test was found 2.1. Hence it was concluded that the there was significant improvement in the leg cramps after the nursing care i.e. stretching exercise and cycling exercise followed by leg massage for the patients with renal failure undergoing the Hemodialysis treatment.

CONCLUSION

The study aims that to assess the effectiveness of nursing intervention on leg cramps for patients undergoing

Hemodialysis in selected hospitals. The study comprises 30 chronic renal failure patients undergoing Hemodialysis in selected hospitals. Non probability purposive sampling technique was used for present study. Numerical Analogous scale and Pain Scale, a standardized research tool was used for data collection. The results show that, most of 36.7 % of patients was having severe legs cramps and 63.3% of patients were having moderate leg cramps. After successfully implementing selected nursing intervention, there was significantly reduction in leg cramps among patients undergoing Hemodialysis. There was no significant association found with selected demographic variable.

REFERENCES

1. Smith C, Swan SK et al., Does uraemia protect Against the demyelination association with correction of hyponatremia during hemodialysis, American journal of Nephrology,2009;2(3)12-14.
2. Georgi Abraham. "Dialysate composition and Hemodialysis hypertension." 2009; 211-13.
3. Agraharkar M, Martinez M.A, et al. "Hospitalization for initiation of maintenance of hemodialysis" Nephron clinical practice, 2007; 54-60.
4. Beena, Trilo G, Ferrero et al. "Acute neurological complications of hemodialysis" Italy journal of neuroscience 1991 2 (1):53-56.
5. US Health care finance administration report, leg exercise during hemodialysis, 2008;10-11.
6. Headley B, Pipim etal, Stretching exercise of leg in Hemodialysis, Australian journal of medicine, 2007; 22 (21)p. 111-14.
7. Campbell Textbook of urology, 8th edition, Philadelphia W.B. Saunders Company, 2006; p. 212-14.
8. Andrew RD, Seizure and acute osmotic change, clinical and neuro-physiological aspects, journal of neurology ;2009, 7(6) 462-67.

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