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# A Study on Medical Management in End Stage Renal Disease In Patient on Haemodialysis

*Likitha Nanga [1],Geena Gimson [1], G.Veeramani [1],Dr .K.Baburaj [2].
[1]*Department Of Pharmacy, Annamalai University, Annamalai Nagar, Tamilnadu, India.*
[2]*Department Of Medicine At Raja Muthiah Medical College & Hospital,*
*Annamalai University, Annamalai Nagar, Tamilnadu, India.*
*Corresponding Author:Likitha Nanga*

***Abstract:*** *End –stage renal disease (ESRD) is the final stage of chronic kidney disease in which the kidney no longer function well enough to meet the needs of dailylife. Based on this, a Prospective Observational study was performedin Department of Medicine, at RMMCH, Annamalai University, TamilNadu, period of study 6 months; Between November 2016 and April 2017. Totally 54 patients were enrolled based on the inclusion and exclusion criteria.The patients were counseled about their disease and lifestyle modification. The objective of the study is to find out the socio-demographic characteristics of ESRD patients, to observe the variation in blood pressure before and after hemodialysis, anemic condition in hemodialysis patient and to study the drug use pattern in ESRD patients at RMMCH. In our study we observed that males are majorly affected with ESRD and the patients of age group of 30-40 years are mostly affected than other age group.The working status of the patients enrolled in our study was mostly daily wagers and farmers. In male the risk factor of alcohol consumption is mostly noticed. By observing both pre and post dialysis data we could be noticed that there is an increase in blood pressure after dialysis, but in few patients we also observed that decrease in BP after dialysis. In our study the mean of the haemoglobin level is low as compared with the target range recommended by the KDOQI guidelines and they are treated with injection iron sucrose and erythropoietin to increase the Hgb level. Blood transfusions are given only to the patients with very poor haemoglobin level. Among all the antihypertensive drugs prescribed amlodipine (calcium channel blocker) was majorly prescribed drug, followed by (cardioselective beta blocker). Combination of diuretic and calcium channel blockers was commonly prescribed in DM with HT patients. From our study we conclude that monotherapy is preferred for the haemodialysis patients on long term use of antihypertensive drugs for the better control of blood pressure.*

***KeyWords****: Hemodialysis, End stage renal disease (ESRD), Antihypertensive, hemoglobin(Hgb), kidney disease outcomes quality intiative (KDOQI)guidelines.*

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## I. Introduction

End –stage kidney disease (ESRD) is the final stage of chronic kidney disease in which the kidney no longer function well enough to meet the needs of daily life. ESRD is most commonly caused by diabetes and hypertension. other causes are like glomerulonephritis ,polycystic kidney disease , interstial nephritis etc., the treatment for ESRD are dialysis or kidney transplantation , in some cases lifestyle changes and drug treatment may help. Hemodialysis is a process that uses a dialyzer to remove wastes such as urea, from the blood, restore the proper balance of electrolytes in the body, and eliminate extra fluid from the body. The objective of our study is to observe the variation in blood pressure before and after hemodialysis, to study the drug use pattern, to observe the anemic condition and socio-demographic characteristics of ESRD patients admitted in RMMCH.

## II. Materials And Methods

This study was conducted in ward of medicine, Rajah Muthiah medical college hospital, Annamalai Nagar, TamilNadu, which is 1260 bedded multi-specialty tertiary care teaching hospital from the period of 2016 to 2017. Required data collected from patient case sheet and recorded in a specially designed proforma and the study was ethically approved.

***Inclusion Criteria:***

- Patient who are on regular hemodialysis.
- Patient's age group above 30 years.
- Patients with CKD associated with HT
- Patient who were admitted in hemodialysis unit at RMMCH.

***Exclusion Criteria:***
• Patient with Co-morbidity
• Patient who are not willing to participate

## III. Results

**TABLE NO.:1 Demographic data of ESRD patients**

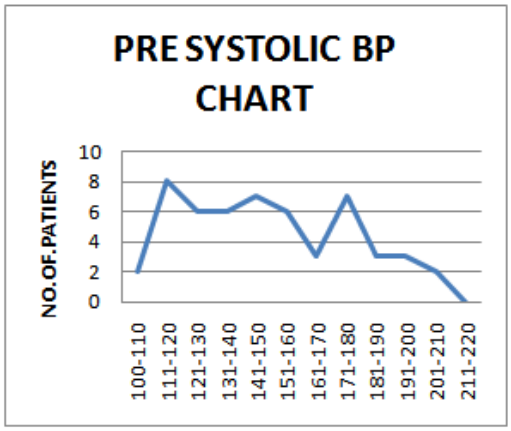
| Characteristics | | No. of Patients | Percentage |
|---|---|---|---|
| SEX | Male | 37 | 68.6 |
| | Female | 17 | 31.4 |
| AGE | 30-40 | 25 | 46.3 |
| | 41-50 | 11 | 20.4 |
| | 51-60 | 10 | 18.5 |
| | 61-70 | 4 | 7.4 |
| | 70< | 4 | 7.4 |
| OCCUPATION | Daily wages/Farmers | 23 | 42.4 |
| | Employed | 13 | 24.3 |
| | Home maker | 11 | 20.3 |
| | Unemployed | 7 | 13 |
| PERSONAL HABITS | Alcoholic | 22 | 40.7 |
| | Alcoholic+ Smoker | 6 | 11.1 |
| | Alcoholic+ smoker+ Tobacco | 4 | 7.4 |
| | Tobacco | 3 | 5.5 |

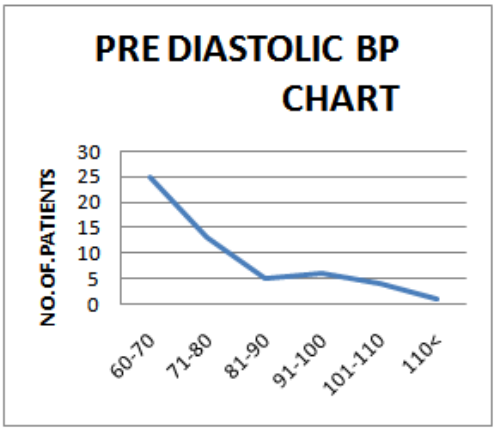
In our study we observed that out of 54 patients, males are affected more (69%) than females (31%), majority of patients (46.2%) belongs to the age group of 30-40 years and majority of patients (42.4%) were daily wages/farmers.
Out of 54 patients enrolled in the study, most of the males (59.2%) were chronic alcohol consumers, which is one of the major risk factors of CKD. Patients who are having no past history of any of above personal habits the causes may be diabetes or drug.

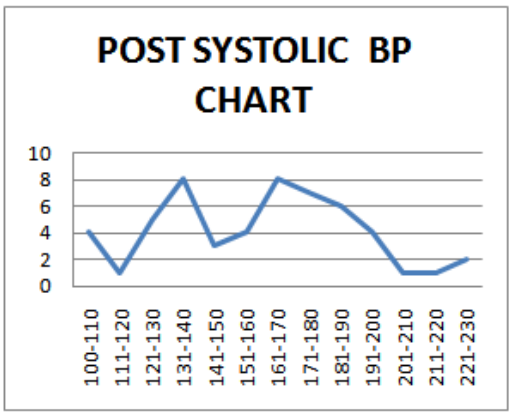
**TABLE NO.2: HEMOGLOBIN LEVELS IN HEMODIALYSIS PATIENTS**
The haemoglobin levels were observed in haemodialysis patients. Among 54 patients, majority of patients (38.8%) having their Hgb level in between 5.1-7.0 gm/dl, followed by 27.7% of patients Hgb level was in between 7.1-9.0 gm/dl. The mean and SD of Hgb is 6.80±1.86.The patients having Hgb below 10gm/dl were treated with erythropoietin and iron sucrose intravenously.

| HEMOGLOBIN LEVEL in gm/dl | NO.OF PATIENTS | PERCENTAGE |
|---|---|---|
| **1 – 3** | 0 | 0 |
| **3.1 – 5** | 11 | 20.3% |
| **5.1 – 7** | 21 | 38.8% |
| **7.1 – 9** | 15 | 27.7% |
| **9.1 – 11** | 5 | 9.2% |
| **11.1 – 13** | 2 | 3.7% |

**TABLE NO.3: VARIATION IN BLOOD PRESSURE IN PRE AND POST DIALYSIS PATIENTS**
By observing both pre and post dialysis data of total 54 patients, we could be noticed that there is an increase in blood pressure for majority of patients after dialysis, but in few patients (22%) we also observed there is decrease in blood pressure after dialysis.



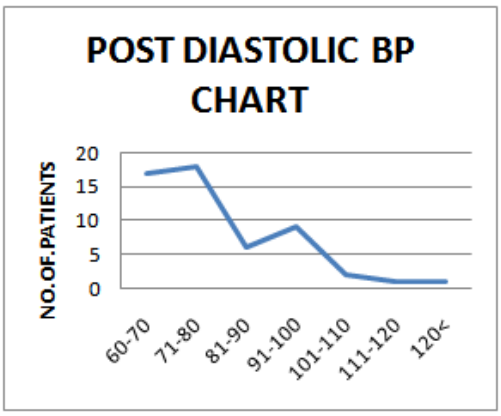
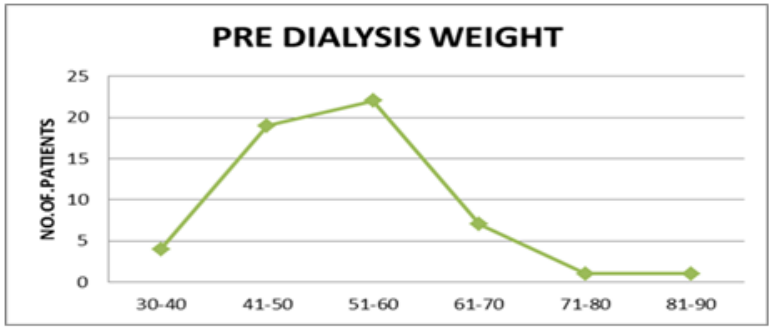
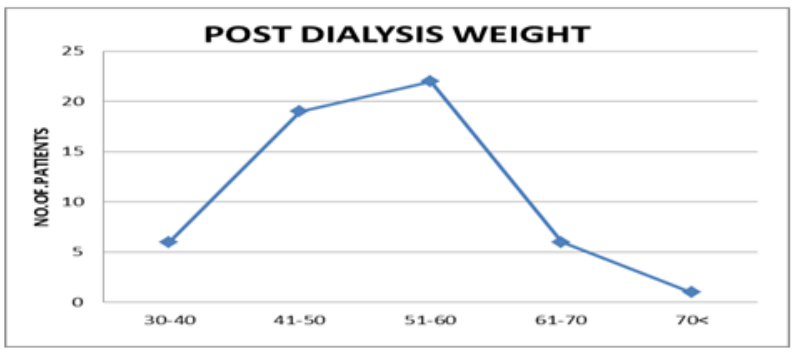




**TABLE NO.4: PRE AND POST WEIGHT OF THE PATIENT DURING HAEMODIALYSIS**




Among the 54 patients the mean and standard deviation of pre and post dialysisweights of the patients were 53.08±8.75 and 50.82±10.69 respectively. Therefore weight of the patient is decreased after dialysis is observed.

**TABLE NO.5: Prescribing Pattern Of Various Classes Of Anti-Hypertensive Drugs**

| CATEGORY | GENERIC NAME | BRAND NAME | DOSE | NO.OF PATIENTS TAKEN |
|---|---|---|---|---|
| Calcium channel blockers | 1.Amlodipine | Amlong | 10mg | 31 |
| | 2.Nifedipine | Nicardia, depin, calcigard | 10mg | 14 |
| | 3.cilnidipine | Cilacar | 10mg | 1 |
| | | | | |
| Beta adrenergic blockers | 1.Atenolol | Aten, aldomet, | 25mg | 19 |
| | 2.Metoprolol | Metzok, prolomet xl | 2.5mg | 6 |
| | | | | |
| Alpha adrenergic blockers | 1.Prazosin | Prasopress, minipress | 5mg | 6 |
| | | | | |
| Central sympatholytic | 1.Clonidine | Clonidine | 0.25mg | 3 |
| | 2.Moxonidine | Moxocard | 0.3mg | 1 |
| | 3.Methyldopa | Medopa | 250mg | 1 |
| | | | | |
| Angiotensin blockers | 1.Losartan | Losartan | 50mg | 1 |
| | 2.Telmisartan | Telsan | 20mg | 1 |
| | | | | |
| α and βblockers | 1.Carvedilol | Cardivas | 3.125mg | 1 |
| | | | | |
| Diuretics | 1.Torasemide | Dytor | 2.5mg | 3 |

These are the various categories of anti-hypertensive drugs that are prescribed to ESRD patients on hemodialysis. Among which amlodipine was the majorly (57.4%) prescribed drug followed by atenolol (35%).

**TABLE NO.6: Drugs Other Than Anti-Hypertensive Agents Prescribed To Esrd Patients**

| | GENERIC NAME | BRAND NAME | CATEGORY | DOSE |
|---|---|---|---|---|
| 1. | Furosemide | Lasix | Diuretics | 40mg |
| 2. | Omeprazole | Omez | Proton pump inhibitor | 20mg |
| 3. | Sodium bicarbonate | nodosis, sodamint | antidiarrheal | 500mg |
| 4. | thiethylperazine | Torpren | Antiemetic | 10mg |
| 5. | mecobalamin | Nurokind | antianemic | 500mg |
| 6. | Folic acid | folate, rudimin | Dietary supplement | 5mg |
| 7. | Domperidone | domstal | Antiemetic | 10 mg |
| 8. | Acenocoumarol | Acitrom | Anticoagulant | 2mg |
| 9. | Cetirizine dihydrochloride | Antrin | antihistamine | 10mg |
| 10. | Calcitriol | active-D, auxitrol, rocaltrol | Vitamin D3 receptor | 0.25mg |
| 11. | Dicloxacillin | Diflor | Antibiotic | 125mg |
| 12. | Calcium carbonate+vitamin D3 | maxical, coxcal | Vitamin supplement | 600mg |
| 13. | Ranitidine | Rantac | H2receptor antagonist | 150mg |
| 14. | levothyroxine | Thyroxine | Thyroid hormone receptor | 50mg |
| 15. | Acetaminophen+tramadol | Ultracet | Nsaid's | 325mg+37.5mg |
| 16. | Clopidogrel | Clopilet | Antiplatelet | 75mg |
| 17. | Aspirin | Ecosprin | Nsaid's | 75mg |
| 18. | Isosorbidedinitrate | ISDN | antianginals | 5mg |
| 19. | Atorvastatin | Atorvas | Hypolipidemic drug | 50mg |
| 20. | Clarithromycin | Claribid | Antibiotic | 250mg |
| 21. | ketoconazole | ketoadol | Antifungal | 200mg |
| 22. | pantoprazole | Pantop | PPI'S | 40mg |

In our study we also observed that these are the various classes of drugs other than anti-hypertensive agents prescribed to the ESRD patients.

**TABLE NO.7: Drugs Given During Hemodialysis**

| S.NO | GENERIC NAME | CATEGORY | ROUTE OF ADMINISTRATION | DOSE |
|---|---|---|---|---|
| 1. | Heparin | Anticoagulants | IV | 10,000u |
| 2. | Erythropoietin | Haematopoietic agent | IV | 4000u |
| 3. | Pheniramine maleate | Anti-allergic drug | IV | 1amp |
| 4. | Levofloxacin | | Oral | 500mg |
| 5. | Paracetamol | Antipyretic | Oral,IM | 500mg,2ml |

| | | | | |
|---|---|---|---|---|
| 6. | Ondensetron | Antiemetic | IV | 4mg |
| 7. | Pantoprazole | Proton pump inhibitor | IV | 40mg |
| 8. | Dextrose | Parenteral nutrition | IV | 100ml |
| 9. | Iron sucrose | Elemental iron | IV | 5ml |
| 10. | Amlodipine | Calcium channel blocker | IV | 2.5mg,5mg, 10mg |
| 11. | Nifedipine | Calcium channel blocker | IV | 5mg |

Generally heparin (anticoagulant) is given to all the patients during hemodialysis and drugs other than heparin are prescribed according to the individual patient's symptoms.

**TABLE NO.8: Comparision Of Anti-Hypertensive Therapy Regime**

| REGIMEN | NO.OF.PRESCRIPTION | PERCENTAGE |
|---|---|---|
| MONOTHERAPY | 28 | 51.8% |
| DUALTHERAPY | 21 | 39% |
| POLYTHERAPY | 05 | 9.2% |

Out of 54 patients enrolled in the study, 52% of patients were on monotherapy, 39% were on dualtherapy and 9% were on polytherapy. In our study we observed that monotherapy was higher when compared to dual and polytherapy, but some of the literatures reported that the combination therapy with fixed initial doses are used to control the adequate blood pressure levels.

**TABLE NO.9: Anti-Hypertensive Agents Used As Monotherapy**

| DRUG NAME | NO.OF.PRESCRIPTION | PERCENTAGE |
|---|---|---|
| Amlodipine | 13 | 47% |
| Nifedipine | 09 | 32% |
| Atenolol | 06 | 21% |
| Total | 28 | |

In our study 28 out of 54 patients were treated with single anti-hypertensive agent. Among these 28 prescriptions Amlodipine (47%) was the majorly prescribed anti-hypertensive agent, followed by Nifedipine (32%) and Atenolol (21%).

**TABLE NO. 10: Anti-Hypertennsive Agents Used As Dual Therapy**

| DRUG NAME | NO.OF.PRESCRIPTION | PERCENTAGE |
|---|---|---|
| Amlodipine+Atenolol | 06 | 29% |
| Metoprolol+Nifedipine | 02 | 9.5% |
| Amlodipine+Metoprolol | 03 | 14.2% |
| Amlodipine+Clonidine | 02 | 9.5% |
| Amlodipine +Prazosin | 03 | 14.2% |
| Nifedipine +Prazosin | 02 | 9.5% |
| Atenolol +cilnidipine | 01 | 4.7% |
| Amlodipine+methyldopa | 01 | 4.7% |
| Atenolol+telmisartan | 01 | 4.7% |
| Total | 21 | |

In our study 21 out of 54 patients were treated with combinations of two anti-hypertensive agents. Among these 21 prescriptions Amlodipine+Atenolol was the majorly prescribed combination of anti-hypertensive agent, followed by Amlodipine+Metoprolol (14.2%) and Amlodipine +Prazosin (14.2%) equally.

**TABLE NO.11: Anti-Hypertensive Agents Used As Polytherapy**

| DRUG NAME | NO.OF.PRESCRIPTION | PERCENTAGE |
|---|---|---|
| Atenolol+Amlodipine+Prazosin | 02 | 40% |
| Prazosin+Metoprolol+Nifedipine | 01 | 20% |
| Amlodipine+atenolol+prazosin+losartan | 01 | 20% |
| Prazosin+moxodine+metoprolol | 01 | 20% |
| Total | 05 | 100% |

In our study 5 out of 54 patients were treated with anti-hypertensive agents under poly therapy. In the presence study we observed that the maximum three drugs were used under polytherapy. Among these Atenolol+Amlodipine+Prazosin (40%) was the majorly used combinations.

## IV. Conclusion

The motive of our study is to observe the drug use pattern of ESRD patients on hemodialysis. Among all the antihypertensive drugs prescribed amlodipine (calcium channel blocker) was majorly prescribed drug, followed by (cardioselective beta blocker). Combination of diuretic and calcium channel blockers was commonly prescribed in DM with HT patients.

From our study, men are majorly affected with ESRD and the patients of age group of 30-40 years are mostly affected than other age group.

The working status of the patients enrolled in our study was mostly daily wagers and farmers.
In males the risk factor of alcohol consumption is mostly noticed and other reasons for CKD may be diabetic nephropathy or drug induced cause.
By observing both pre and post dialysis data we could be noticed that there is an increase in blood pressure after dialysis, but in few patients we also observed that decrease in BP after dialysis.
In our study the mean of the haemoglobin level is low as compared with the target range recommended by the KDOQI guidelines and they are treated with injection iron sucrose and erythropoietin to increase the Hgb level.
Blood transfusions are given only to the patients with very poor haemoglobin level.
From our study we conclude that monotherapy is preferred for the hemodialysis patients on long term use of antihypertensive drugs for the better control of blood pressure.

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