ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 17, Issue, 06, pp.33308-33311, June, 2025
DOI: https://doi.org/10.24941/ijcr.49168.06.2025

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

COMPARATIVE STUDY OF AGE AND SEX SPECIFIC DISTRIBUTION AMONGST PATIENTS OF HEMODIALYSIS AND PERITONEAL DIALYSIS.

Dr. Ruta Anandgaonkar[1], Mr. Anil Bhutkare[1], Dr. Dhananjay Bhale[2] and Dr. Kshitija Gadgekar[3]

[1]Assistant Professor Biochemistry, MGM Medical College, Chh. Sambhajinagar; [1]Senior Resident Biochemistry, G.M.C, Parbhani; [2]Professor Biochemistry and Ex Head of Department of Biochemistry, MGM Medical College; Chh. Sambhajinagar [3]Professor and Head Nephrology, MGM Medical College, Chh. Sambhajinagar

ARTICLE INFO

Article History:
Received 09th March, 2025
Received in revised form
21st April, 2025
Accepted 19th May, 2025
Published online 24th June, 2025

Key words:

Hemodialysis, Peritoneal Dialysis, Esrd End Stage Renal Disease.

***Corresponding author:**
Dr. Ruta Anandgaonkar

ABSTRACT

Worldwide, the incidence of end-stage renal disease (ESRD) in the elderly has risen in the past decades resulting in a rapidly growing number of older patients starting haemodialysis.[1-2] The elderly have a higher prevalence of comorbidities that increase the burden of dialysis, and a substantially higher mortality rate compared with younger counterparts.[3-4] ESRD is one of major worldwide wellbeing issues. Although most nephrologists acknowledge that iHD is the least desirable modality, 88% of the prevalent ESKD patient population on dialysis use iHD, and only 11% use PD. [5] Its predominance is continuously expanding around the world. In ESRD, hemodialysis (HD) and peritoneal dialysis are basically utilized for renal replacement therapy.[6-7] **Aim and Objectivies:** Comparative study of age and sex specific distribution amongst patients of hemodialys is and peritoneal dialysis. **Materials and Methods:** This Comparative Observational study was conducted on diagnosed patients of end stage renal disease undergoing hemodialysis and peritoneal dialysis in Department of Biochemistry in collaboration with Department of Nephrology MGM Medical College and Hospital, Chh.Sambhajinagar. The study was done between october 2023 and may 2024. **Results and conclusion**: In present study majority cases i.e., 31 (44 %) were from age group 21 to 40 years followed by 24 (34 %) cases from 41 to 60 years.> 60years of age 14 cases (20 %).In the present study, male cases were 44 (62.5%) and female cases were 26 (37.5%). The male-to-female ratio was 1.69:1.

Citation: Dr. Ruta Anandgaonkar, Mr. Anil Bhutkare, Dr. Dhananjay Bhale and Dr. Kshitija Gadgekar. 2025. *"*Comparative study of age and sex specific distribution of hemodialysis and peritoneal dialysis patients.*". International Journal of Current Research, 17, (04), xxxx-xxxxx.*

INTRODUCTION

Worldwide, the incidence of end-stage renal disease (ESRD) in the elderly has risen in the past decades resulting in a rapidly growing number of older patients starting haemodialysis **(1-2).** The ageing phenomenon in the dialysis population is amplified by a more liberal acceptance of older patients on dialysis, better survival of dialysis patients and reduced access to transplantation for elderly patients. The elderly have a higher prevalence of comorbidities that increase the burden of dialysis, and a substantially higher mortality rate compared with younger counterparts**(3, 4).** In patients with incident ESRD in the US in 2016, the rates of iHD and PD use were 87% and 10%, respectively. Although most nephrologists acknowledge that iHD is the least desirable modality, 88% of the prevalent ESKD patient population on dialysis use iHD, and only 11% use PD. [5] ESRD is one of major worldwide wellbeing issues. Its predominance is continuously expanding around the world. In ESRD, hemodialysis (HD) and peritoneal dialysis are basically utilized for renal replacement therapy **(6-7).**

AIM AND OBJECTIVIES

Comparative study of age and sex specific distribution amongst patients of hemodialysis and peritoneal dialysis.

MATERIALS AND METHODS

ELIGIBILITY CRITERIA

INCLUSION CRITERIA

- Patients more than 18 years old.
- Patients who are dialyzed for 4 hours thrice a week for at least 3 months**.**

EXCLUSION CRITERIA: The exclusion criteria were length of hemodialysis <2 months, altered thyroid or hepatic functions. This Comparative Observational study was conducted on 70 diagnosed patients of end stage renal disease undergoing hemodialysis and peritoneal dialysis in

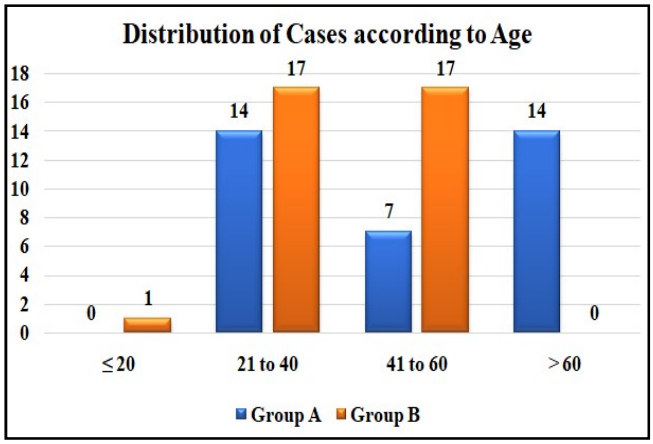
Department of Biochemistry in collaboration with Department of Nephrology MGM Medical College and Hospital, Chh. Sambhajinagar between October 2023 and May 2024. The study was approved by the ethical committee of the MGM Medical College and Hospital, Chh .Sambhajinagar.

OBSERVATION AND RESULTS

As shown in Table1, majority cases i.e., 31 (44 %) were from age group 21 to 40 years followed by 24 (34 %) cases from 41 to 60 years (Graph 1). As shown in Table2, male cases were 44 (62.5 %) and female cases were 26 (37.5 %). Male to female ratio was 1.69:1 (Graph 2)

Table 1. Distribution of Cases according to Age

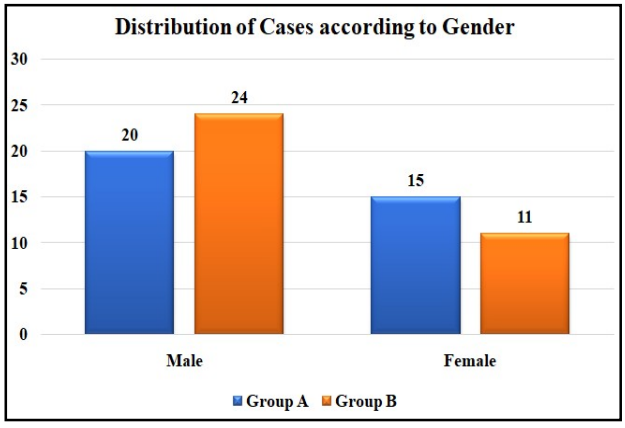
Sr. No.	Age group(Years)	Group A (HD) N (%)	Group B (PD) N(%)	Total N(%)
1	≤20	0 (0 %)	1 (2 %)	1 (2 %)
2	21 to 40	14 (20 %)	17 (24 %)	31 (44 %)
3	41 to60	7 (10 %)	17 (24 %)	24 (34 %)
4	> 60	14 (20 %)	0 (0 %)	14 (20 %)
Total		35(50 %)	35(50 %)	70 (100%)



Graph 1. Distribution of Cases according to Age

Table 2. Distribution of Cases according to Gender

Sr. No.	Gender	Group A (HD) N(%)	Group B (PD) N (%)	Total N (%)
1	Male	20 (28.5 %)	24(34%)	44(62.5%)
2	Female	15(21.5%)	11(16%)	26(37.5%)
Total		35(50 %)	35(50 %)	70(100 %)



Graph 2. Distribution of Cases according to Gender

DISCUSSION

Chronic kidney disease (CKD) is a slowly progressing illness that damages the kidneys.

Prevalence of CKD patients undergoing hemodilysis and peritoneal dialysis: The incidence of ESKD over the last 20 years has increased. According to the United States Renal Data System (USRDS), a national data system around CKD and ESKD in the United States, there were approximately 750,000 patients with prevalent ESKD in the United States in 2017, of which a majority are on dialysis (in-centre hemodialysis (iHD), peritoneal dialysis (PD), or home HD. In patients with incident ESRD in the US in 2016, the rates of iHD and PD use were 87% and 10%, respectively. Although most nephrologists acknowledge that iHD is the least desirable modality, 88% of the prevalent ESKD patient population on dialysis use iHD, and only 11% use PD.[8]

End stage treatment: When a patient reaches stage 5 and their kidney is operating at 15% of its normal capability, end-stage treatment usually starts. It happens when a person adjusts their food, lifestyle, and medications, but their kidneys are still unable to cope with the body's need to eliminate waste and fluid. Because of this, dialysis or a kidney transplant are required for the survival of an individual with end-stage renal illness. When the kidneys are no longer able to remove waste materials and excess fluid from the blood, dialysis is the mechanical process of doing so. A dialyzer, often known as an artificial kidney, is a device that removes blood from a patient's body. Blood is reintroduced into the body through tubes after the trash is filtered out by the machine. This technique can be performed at home; however, it usually takes place in a hospital or dialysis facility. [9,10,11]

Renal dialysis comes in two primary varieties. They are as follows

Hemodialysis: Hemodialysis is the procedure of evacuating solutes from the body using a semipermeable counterfeit membrane when blood comes into contact with them during extracorporeal circulation. It maintains the liquid and electrolytes in routine homeostasis.[12]

Peritoneal dialysis: Peritoneal dialysis (PD) is important for patients recently requiring RRT due to the conservation of residual renal function (RRF), higher quality of life, and hemodynamic constancy in comparison with hemodialysis (HD). [13]

Age distribution: In present study majority cases i.e., 31 (44 %) were from age group 21 to 40 years followed by 24 (34 %) cases from 41 to 60 years.. Number of cases > 60years of age were 14 (20 %) (Table1,Graph 1). 14 (20 %) cases between age group 21 to 40 were requiring hemodialys . 17 (24 %) cases between age group 21 to 40 were requiring peritoneal dialysis. (Table1,Graph 1). 7 (10 %) cases between age group 41 to 60 were requiring hemodialysis. 17 (24 %) cases between age group 41 to 60 were requiring peritoneal dialysis. (Table1,Graph 1). 14 (20 %) cases with age group > 60years of age were requiring hemodialysis. No cases were between age group > 60years of age were requiring peritonealdialysis. (Table1,Graph 1).

In a similar study by Y XU, XQ DING *et al*. discovered that the research group's mean age was 58.9 ± 14.3 years, while the mean age of 20 age-matched, healthy control subjects was 56.5 ± 12.7 years. Between the maintenance hemodialyser patients and the healthy control participants, there was no significant difference in terms of age or gender. [14] Anna A. Bonenkamp *et al*. found the mean age of hemodialysis patients to be 62.5 ± 14.0 in their study. [15] Yohan Park *et al*. discovered that 5.7% of patients were under 45 years old, 19.6% were between 45 and 64 years old, 28.2% were between 65 and 74 years old, and 46.5% were above 75 years old.[16] N. van Loon *et al*. discovered that the patients' mean age was 64 years old, with 24% being above 75 years old.[17] Mythri Shankar *et al*. discovered 374 adult patients who were >18. The mean age for men and women was 46.95 ± 12.65 and 46.63 ± 13.66 years, respectively.[18]

Gender distribution

In the present study, male cases were 44 (62.5%) and female cases were 26 (37.5%). The male-to-female ratio was 1.69:1 (Table 2, Graph 2). 20 (28.5 %) Male patients were requiring hemodilysis and 15(21.5%) female patients were requiring hemodilysis. 24 (34%) Male patients were requiring peritoneal dialysis and11 (16%) female patients were requiring peritoneal dialysis. In a similar study by Mythri Shankar *et al*., they found that most of the patients (72.7%) were men.(18) Hannah Beckwith *et al*., in their study, found 36 out of 54 (65%) were male. (19) Results of our studies are similar to studies of Mythri Shankar *et al* and Hannah Beckwith *et al*. Jihan Sleiman *et al*., in their study, found 73% of females and 80% of men. A study conducted in Spain also revealed that 20.8% of females are dialyzed through a catheter, 67.7% through a local AVF, and 11.5% through an AV join vs. 10.8, 81.2, and 8%, respectively, in men. This gender dissimilarity in vascular access might be related to sex differences in the size and quality of vessels, leading to a higher obstruction rate and a higher frequency of infectious complications reported in women. (20) In their research, Savannah L. Vogel *et al*. discovered that women were older than men when they started dialysis (60.0 vs. 59.6, $p < 0.001$), that their percentage of black race was higher (33.2 vs. 28.2, $p < 0.001$), and that their underlying cause of ESRD was more likely to be diabetes (50.1 vs. 46.0, $p < 0.001$). Regarding comorbidities, men were shown to be more likely than women to have more than three (15.9 vs. 13.7, $p < 0.001$). Peritoneal dialysis was the first dialysis modality used by 7.9% of women and 7.5% of men in the USRDS population. (21)

- In the present study, the majority cases requiring dialysis, i.e., 31 (44%), were from the age group of 21 to 40 years, followed by 24 (34%), cases from 41 to 60 years (Table 1,Graph 1).
- In the present study, male cases requiring dialysis were 44 (62.5%) and female cases were 26 (37.5%). The male-to-female ratio was 1.69:1 (Table 2, Graph 2).

REFERENCES

1. Jager KJ, van Dijk PC, Dekker FW. *et al*. The epidemic of aging in renal replacement therapy: an update on elderly patients and their outcomes. Clin Nephrol 2003; 60: 352–360 (DOI) (PubMed) (Google Scholar)
2. 10. Kurella M, Covinsky KE, Collins AJ. *et al*. Octogenarians and nonagenarians starting dialysis in the United States. Ann Intern Med 2007; 146: 177–183 (DOI) (PubMed) (Google Scholar)
3. 11. Canaud B, Tong L, Tentori F. *et al*. Clinical practices and outcomes in elderly hemodialysis patients: results from the Dialysis Outcomes and Practice Patterns Study (DOPPS). Clin J Am Soc Nephrol 2011; 6: 1651–1662 (DOI) (PMC free article) (PubMed) (Google Scholar)
4. 12. Chauveau P, Combe C, Laville M. *et al*. Factors influencing survival in hemodialysis patients aged older than 75 years: 2.5-year outcome study. Am J Kidney Dis 2001; 37: 997–1003 (DOI) (PubMed) (Google Scholar)
5. Pattharawin Pattharanitima *et al*. The Association between Prevalence of Peritoneal Dialysis versus Hemodialysis and Patients' Distance to Dialysis-Providing Facilities. KIDNEY360 2: 1908–1916, December, 2021
6. Geoffrey M. Fleming. Renal replacement therapy review Organogenesis 7:1, 2-12; January/February/March 2011.
7. Lee *et al*. Top 100 cited articles on hemodialysis Medicine (2021) 100:38
8. Pattharawin Pattharanitima *et al*. The Association between Prevalence of Peritoneal Dialysis versus Hemodialysis and Patients' Distance to Dialysis-Providing Facilities. KIDNEY360 2: 1908–1916, December, 2021
9. E. Mimi Arquilla Symptoms, stages, and treatment of chronic kidney disease (CKD) Jan 12 2024 Medical news today.
10. Muhammad F. Hashmi; Onecia Benjamin; Sarah L. Lappin End-Stage Renal Disease, StatPearls (Internet). 16 May 2018PMID: 29763036
11. Ashwini R. Sehgal, MD What Is the Best Treatment for End-stage Renal Disease? AmJMed.2002;112:735–736.
12. Murdeshwar HN, Anjum F. Hemodialysis. (Updated 2022 Nov 20). In: StatPearls (Internet). Treasure Island (FL): StatPearls Publishing; 2022 Jan-.
13. Yukio Maruyama *et al*. Comparison of peritoneal dialysis and hemodialysis as first renal replacement therapy in patients with end-stage renal disease and diabetes: a systematic review Renal Replacement Therapy (2019) 5:44
14. Y XU, XQ DING et.al. Serum Hepcidin in Haemodialysis Patients: Associations with Iron Status and Microinflammation The Journal of International Medical Research 2011; 39: 1961 – 1967
15. Anna A. Bonenkamp, *et al*. Trends in home dialysis use differ among age categories in past two decades: A Dutch registry study. Eur J Clin Invest. 2022;52:e13656
16. Yohan Park, *et al*. Importance of dialysis specialists in early mortality in elderly hemodialysis patients: a multicenter retrospective cohort study. www.nature.com/scientificreports (2024) 14:1927 | https://doi.org/10.1038/s41598-024-52170-9
17. N. van Loon *et al*. Quality of life as indicator of poor outcome in hemodialysis: relation with mortality in different age groups Loon *et al*. BMC Nephrology (2017) 18:217
18. Mythri Shankar *et al*. Gender disparity in maintenance hemodialysis units in South India: a cross-sectional observational study. Frontiers in Nephrology 10.3389/fneph.2024.1322003.

19. Hannah Beckwith *et al*. Gender Differences in Experiences and Expectations of Hemodialysis in a Frail and Seriously Unwell Patient Population. Kidney Int Rep (2022) 7, 2421–2430; https://doi.org/10.1016/j.ekir.2022.08.023
20. Jihan Sleiman *et al*. Access to treatment in chronic kidney disease, dialysis and transplantation. Is there gender equality? Frontiers in Medicine 10.3389/fmed.2023.1176975
21. Savannah L Vogel *et al*. Gender differences in peritoneal dialysis initiation in the US end-stage renal disease population. Peritoneal Dialysis International. 2020, Vol. 40(1) 57–61

****