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Drug Utilization Evaluation among the Patients with Renal Disease In a Tertiary Care Hospital

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ABSTRACT

Aim: The main aim of this study was to conduct drug utilization evaluation among the patients with renal disease in a tertiary care hospital.

Materials and Methods: An observational study was conducted among 102 patients for a period of six months in a tertiary care teaching hospital. Both male and female genders with renal diseases undergoing pharmacological therapy who were aged between 20-70 years were included in this study. Pregnant and lactating women and patients with incomplete laboratory data were excluded from this study.

Results: Out of 102 patients included in this study, 54.9% (n=56) were male and 45.1% (n=46) were female. In this study, antibiotics (17.3%) were prescribed mostly and anti-fungals (1.9%) were found to be less prescribed. Among the antibiotics used, combination of Piperacillin + β-lactamase inhibitors were prescribed mostly followed by combination of Cephalosporins + β-lactamase inhibitors and Aminoglycosides were prescribed leastly.

Conclusion: Drug utilization evaluation plays a major role to evaluate and improve drug use especially in a country like India, where illiteracy, poverty, different medicine system practices, dispensing without prescription, predominance in medical and marketing field and lack of drug information is evident. It is critical that standard guidelines in the therapeutic management to be developed and adopted that will help to prescribe the medication based on the evidence, hence improves the overall quality of drug use and ensures betterment of patients.

Introduction

Kidney diseases also known as renal diseases are silent killers. About 1 in 10 people is affected by kidney disease globally [1]. About 850 million people worldwide are now estimated to have kidney disease due to various causes. In India, the most common causes of kidney disease in both men and women are diabetes and hypertension. The common kidney disease is chronic kidney disease (CKD) and it affects about 10% of the world's population [2].

CKD is the 6th fastest growing cause of death. CKD burden is increasing worldwide. Inappropriate drug use may lead to increased cost of medical care, anti-microbial resistance, adverse effects and patient mortality. Rational drug use is an important factor to be checked for the optimal benefit of drug therapy in patient care.

Drug utilization evaluation (DUE) is mostly required in the multi-drug use diseased conditions like renal disease. According to WHO, drug utilization evaluation is an ongoing, systematic, criteria-based programme of medicine evaluations that will help ensure appropriate medicine use [3,4]. The main aim of this study was to conduct drug utilization evaluation among the patients with renal disease in a tertiary care hospital.

Materials and Methods

An observational study was conducted among 102 patients for a period of six months in a tertiary care teaching hospital. Both male and female genders with renal diseases undergoing pharmacological therapy who were aged between 20-70 years were included in this study. Pregnant and lactating women and patients with incomplete laboratory data were excluded from this study.

Results

Out of 102 patients included in this study, 54.9% (n=56) were male and 45.1% (n=46) were female. Table 1 represents age-wise distribution of patients with renal disease in which renal diseases were observed more among the age group 51-60 years i.e. 27.5% (n=28) and least among the age group 21-30 years i.e., 13.7% (n=14).

Table 1: Age-wise distribution

Age (in years)	Total (%)
21-30	14 (13.7)
31-40	16 (15.7)
41-50	24 (23.5)
51-60	28 (27.5)
61-70	20 (19.6)
Total	**102 (100)**

Table 2 represents the frequency of different class of drugs prescribed in which antibiotics were prescribed mostly and anti-fungals were found to be less prescribed.

Table 2: Class-wise distribution of drugs

Class of drugs	Total (%)
Anti-fungals	9 (1.9)
Potassium sparing diuretics	19 (3.9)
Erythropoiesis Stimulating Agents	22 (4.6)
Phosphate binders	22 (4.6)
Diuretics	26 (5.4)
Hematinics	27 (5.6)
Anti-hypertensives	36 (7.5)
Alkalizing agents	46 (9.6)
Supplements	81 (16.9)
Antibiotics	83 (17.3)
Others	109 (22.7)
Total	**480 (100)**

Among the antibiotics used, combination of Piperacillin + β-lactamase inhibitors were prescribed mostly followed by combination of Cephalosporins + β-lactamase inhibitors and Aminoglycosides were prescribed leastly. It was observed that injectable form (70%, n=58) of antibiotics were more used when compared to oral form (30%, n=25).

Table 3: Class-wise distribution of antibiotics

Class of antibiotics	Total (%)
Aminoglycosides	1 (1.2)
Lincomycin	2 (2.4)
Macrolides	3 (3.6)
Fluoroquinolones	10 (12)
Nitrofurantoin	15 (18.1)
Cephalosporins	16 (19.3)
Cephalosporins+β-lactamase inhibitors	16 (19.3)
Piperacillin+ β-lactamase inhibitors	20 (24.1)
Total	**83 (100)**

Table 4 represents the class of anti-hypertensives used in this study in which Ca^{+2} channel blockers were mostly prescribed (n=18) and ACEIs were prescribed less (n=2) in number.

Table 4: Distribution of anti-hypertensives

Anti-hypertensives	Total (%)
Angiotensin Converting Enzyme Inhibitors (ACEIs)	2 (5.6)
α-blockers	4 (11.1)
β-blockers	5 (13.9)
Angiotensin Receptor Blockers (ARBs) + Thiazides	7 (19.4)
Ca^{+2} channel blockers	18 (50)
Total	**36 (100)**

Table 5 represents the class of diuretics that was used mostly in this study. Furosemide was the commonly prescribed drug among the diuretics.

Table 5: Distribution of diuretics

Diuretics	Total (%)
Furosemide+Spironolactone	3 (11.6)
Torsemide	5 (19.2)
Furosemide	18 (69.2)
Total	**26 (100)**

Table 6 represents the supplements prescribed among patients with renal disease. Anti-oxidants were prescribed more to be more when compared to multi-vitamins.

Table 6: Distribution of supplements

Supplements	Total (%)
Multivitamin	10 (12.4)
Calcium+Cholecalciferol	18 (22.2)
Anti-oxidants	53 (65.4)
Total	**81 (100)**

Table 7 represents the distribution of hematinics among the patients with renal disease. Combination of iron and folic acid was preferred more than elemental iron.

Table 7: Distribution of hematinics

Hematinics	Total (%)
Elemental Iron	1 (3.7)
Iron + Folic acid	26 (96.3)
Total	**27 (100)**

Discussion

This observational study was conducted for a period of six months at a tertiary care hospital in Andhra Pradesh among 102 inpatients with renal disease. Drug utilization evaluation not only enables us to study the pattern of drug use but also gives access for implementing rationality in prescription pattern. In this study, we observed that the maximum

number of patients was from the age group of 51-60 years and a least number of patients were from the age group 21-30 years. This finding is in concurrence with the results of Mary et al. which concluded that above the age of 40 years, GFR declines by 10ml/min/1.73m^2 such that by age 70 years the GFR has declined about 30ml/min/1.73m^2, thus contributing to renal disease [5].

Male patients (n=56, 54.90%) were higher in number than female patients (n=46, 45.10%) in this study. A study conducted by Juan J. C. et al. also demonstrated similar findings elaborating the result that the protective effects of estrogen in women and/or the damaging effect of testosterone together with unhealthier lifestyle might cause kidney function to decline faster in men than in women [6].

Maximum number of drugs were dispensed from the class of antibiotics (n=83) and least number of drugs were from the class of anti-fungal (n=9). Ca^{+2} channel blockers (n=18) were the most prescribed class of anti-hypertensives followed by combination of Angiotensin receptor blockers (ARBs) + Thiazides (n=7) and least was from the class of Angiotensin converting enzyme inhibitors (ACEIs) (n=2). These findings were similar to that of the results of B. L. Carter [7] which concluded that Ca^{+2} channel blockers may have nephroprotective effects because they are metabolized extensively, thus not requiring significant dosage adjustments. Loop diuretics (n=23) were prescribed more compared to a combination of Loop + K^+ sparing diuretics (n=3). This finding is similar to the study conducted by Domenic A. Sica [8].

Conclusion

Drug utilization evaluation plays a major role to evaluate and improve drug use especially in a country like India, where illiteracy, poverty, different medicine system practices, dispensing without prescription, predominance in medical and marketing field and lack of drug information is evident. It is critical that standard guidelines in the therapeutic management to be developed and adopted that will help to prescribe the medication based on the evidence, hence improves the overall quality of drug use and ensures betterment of patients.

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