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Overview and Management of Chronic Kidney Disease Inpatients at Royal Prima General Hospital Medan in 2020

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ABSTRACT

Chronic kidney disease (CKD) is a condition in which there is a gradual decline in kidney function. This disease is progressive and usually irreversible. Indications for hospitalized CKD patients with severe complications and do not allow inpatient therapy. This study was aimed to describe the overview and management of chronic kidney disease inpatient in Royal Prima General Hospital Medan. The type of research used is research with a descriptive and retrospective case study design. This study is based on medical record data related to inpatient CKD patients' diagnostic and management features at the Royal Prima General Hospital Medan in 2020. The research subjects were all inpatients diagnosed with CKD, whereas 100 research subjects with complete medical records were included in this study. It was found that the highest age group was 57-65 years, as much as 37.0%, and men as much as 27%. The chief complaint was shortness of breath at 43% and additional complaints, the most of which were fever + low back pain + edema at 38%. On physical examination, most of the inspections were weak, 55%. Most palpation was sociable 57%. There was auscultation of four abdominal regions and normal positive bowel sounds (93%). Complete blood count + blood sugar level + electrolytes + urea + creatinine 70%, the most combination medication is NaCl 0.9% + Furosemide injection 31%. Based on the length of stay, the longest was 13-14 days (20%).

1. Introduction

Chronic kidney disease (CKD) is defined as an abnormality of kidney structure or function experienced for more than 3 months.[1] CKD is a condition in which there is a gradual decline in kidney function. This disease is progressive and usually irreversible. CKD is caused by diffuse and chronic intrinsic kidney disease.[2] CKD is kidney damage (kidney damage) or decreased glomerular filtration rate (GFR/GFR) < 60 mL/min 1.73 m for a period of more than 3 months.[1-3] CKD is a public health problem worldwide that affects more than 50 million people, and more than one million of them receive renal replacement therapy. The prevalence of CKD is increasing from year to year, even according to the results of the Global Burden of Disease research, chronic kidney disease was the 27th leading cause of death in the world in 1990 and increased to 18th in 2010, while kidney failure was the leading cause of death which reached 1.5 billion.[2,3]

Based on the results of Indonesian Basic Health Research (Riskesdas) and the Indonesian Renal Registry (IRR), the incidence of chronic kidney disease in Indonesia by gender, the prevalence of kidney failure in men is higher (0.3%) than in women (0.2%).[4] Based on age characteristics, the prevalence of kidney failure was highest in the age category above 75 years (0.6%), which began to increase at 35 years and over. Based on education strata, the

highest prevalence of kidney failure was in people who did not attend school (0.4%). Meanwhile, based on people living in rural areas (0.3%), the prevalence was higher than in urban areas (0.2%).4 Based on the IRR 2016, 98% of patients with kidney failure underwent hemodialysis therapy, and 2% underwent Peritoneal Dialysis (PD) therapy. CKD initially does not show signs and symptoms but can progress to kidney failure. CKD can be prevented and managed, and the chances of getting effective therapy will be greater if it is caught early.[4,5]

Indications for hospitalized CKD patients with severe complications and do not allow inpatient therapy. The diagnostic and management procedures for CKD are well known. However, as medical techniques and medical technology continue to develop, diagnostic and management procedures may occur due to differences in place and time. This study was aimed to describe the overview and management of chronic kidney disease inpatient in Royal Prima General Hospital Medan.

2. Methods

The type of research used is research with a descriptive and retrospective case study design. This study is based on medical record data related to inpatient CKD patients' diagnostic and management features at the Royal Prima General Hospital Medan in 2020. The research subjects were all inpatients diagnosed with CKD, whereas 100 research subjects with complete medical records were included in this study. This study uses secondary data using medical records of research subjects, where the data collection process is carried out consecutively so that a minimum of 100 subjects is obtained.

Secondary data from medical records that are displayed and explored include sociodemographic data, data on complaints of research subjects, data on physical examination findings found in research subjects, data on supporting examination findings, medical therapy data, non-medical therapy data complications, length of hospitalization, and circumstances when the patient is discharged from the hospital. Data analysis was carried out using SPSS version 26 software for further descriptive analysis in proportions presented in a narrative and distribution table.

3. Results and Discussion

Table 1. Distribution of proportion of CKD patients by age treated at Royal Prima General Hospital Medan in 2020

Age (years)	Male		Female		Amount	
	F	%	F	%	F	%
21-29	2	2	2	2	4	4
30-38	3	3	3	3	6	6
39-47	11	11	12	12	23	23
48-56	11	11	7	7	18	18
57-65	27	27	10	10	37	37
66-74	6	6	2	2	8	8
75-84	3	3	1	1	4	4
Total	**63**	63	**37**	37	100	100

Table 1 shows that the age most affected by CKD in adults, the highest at the age of 57-65 years amounted to 37 people with the highest percentage of 37%, while the lowest at 21-29 and 75-84 years old were four people with a percentage 4% lowest. Meanwhile, the distribution of the proportion of CKD

patients based on gender, the most affected by CKD in adults is male, namely 63%. In comparison, the lowest is women, namely 37%.

Table 2. Distribution of the proportion of inpatient CKD based on the chief complaint treated at Royal Prima General Hospital Medan in 2020

Chief complaints	**F**	**%**
Shortness of breath	43	43
Low back pain	34	34
Fever	23	23
Total	100	100

Based on the chief complaint, the most common are shortness of breath (43%) followed by low back pain (34%). Based on additional complaints, the most common were low back pain-edema-joint pain (38%), and the least were fever-malaise-back pain-edema (19%). With 100 people with fever, 21 people with nausea, 21 people with vomiting, 40 people with malaise, 57 people with back pain, and 57 with edema.

Table 3. Distribution of the proportion of CKD inpatient based on additional complaints per patient treated at Royal Prima General Hospital Medan in 2020

Additional complaints	**F**	**%**
Fever-nausea-vomit	21	21
Fever- fatigue-malaise	21	21
Fever-low back pain-edema	38	38
Fever-malaise-low back pain- edema	19	19
Total	**100**	**100**

Table 4. Distribution of the proportion of CKD inpatient based on additional complaints treated at Royal Prima General Hospital Medan in 2020

Additional complaints	**F**	**%**
Fever	100	100
Nausea	21	21
Vomit	21	21
Malaise	40	40
Low back pain	57	57
Edema	57	57

The distribution of the proportion of CKD patients based on inspection was mostly weakness (55%), edema (23%), and the least proportion was normal (22%). The distribution of the proportion of CKD patients based on palpation was supple (57%), flat (24%), convex (19%). Distribution of patient proportions based on auscultation of four abdominal regions found patients with normal (+) bowel sounds (93%).

Table 5. Distribution of the proportion of CKD inpatient based on physical examination inspections treated at Royal Prima General Hospital Medan in 2020

Whole body inspection	**F**	**%**
Normal	22	22
Weak	55	55
Edema	23	23
Total	**100**	**100**

Table 6. Distribution of the proportion of CKD inpatient based on physical examination of abdominal palpation treated at Royal Prima General Hospital Medan in 2020

Palpation	**F**	**%**
Supple	57	57.0
Flat	24	24.0
Convex	19	19.0
Total	100	100%

Table 7. Distribution of the proportion of CKD inpatient based on laboratory evaluations per patient treated at Royal Prima General Hospital Medan in 2020

Laboratory examination	**F**	**%**
Complete blood + Blood glucose level Blood+ electrolyte + Urea + creatinine	70	70
Complete blood + urea + creatinine	8	8
Complete blood + urea + creatinine	13	13
Complete blood + blood glucose level + electrolyte	9	9
Total	**100**	**100**

Table 8. Distribution of the proportion of CKD inpatient based on laboratory examinations treated at Royal Prima general hospital Medan in 2020

Laboratory finding	**F**	**%**
Complete blood	100	100
Blood glucose level	79	79
Electrolyte	79	79
Urea	91	91
Creatinine	91	91

It can be seen that laboratory investigations are the most affected by CKD in adults, namely complete blood + blood glucose levels + electrolytes + urea + creatinine and radiology with a percentage proportion of 70.0%. In comparison, the least is complete blood + urea + creatinine, with a percentage proportion of 8%.

Table 9. Distribution of the proportion of CKD inpatient based on laboratory findings treated at Royal Prima General Hospital Medan in 2020

Laboratory finding	Normal	%	Abnormal	%
Urea	11	11	89	89
Creatinine	12	12	88	88
Haemoglobin	14	14	86	86

It can be seen that the results of the laboratory examination for CKD disease contained abnormal urea as many as 89 people with a percentage of 89%, for abnormal creatinine as many as 88 people with a percentage of 88%, and abnormal hemoglobin in 86 people with a percentage of 86% of the entire sample which exists.

Table 10 shows the most combination medication in CKD patients, namely NaCl 0.9% + Furosemide injection with a proportion of 31 with the highest percentage of 31.0%. In comparison, the least is NaCl 0.9% + Ranitidine injection + Furosemide injection amounted to 14 with the percentage of the least proportion of 14.0%.

Table 10. Distribution of proportion of CKD inpatient based on combination medicines per patient treated at Royal Prima General Hospital Medan in 2020

Combination medicines	F	%
NaCl 0,9%+ Ranitidine injection + Furosemide injection	14	14
O_2 3L(nasal canule)+ Furosemide injection + Ranitidine injection	29	29
NaCl 0,9%+ furosemide injection + Ondancentron injection + Ranitidine injection	26	26
NaCl 0,9%+ Furosemide injection	31	31
Total	**100**	**100**

Table 11. Distribution of the proportion of CKD inpatient by medicine treated at Royal Prima General Hospital Medan in 2020.

Therapy	F	%
Nacl 0,9%	71	71
Ranitidine	69	69
Furosamide	100	100
Ondancetron	26	26
O_2 3L	29	29

Table 12. Distribution of proportion of CKD inpatient by non-medical treated at Royal Prima General Hospital Medan in 2020

Non Medical treatment	F	%
Low protein diet	43	43.0
High protein diet	54	54.0
None	3	3.0
Total	**100**	**100**

The distribution of the proportion of CKD patients based on non-medical management was high-protein intake with a proportion of 54%, and the lowest intake was not given with a proportion of 3%. Distribution of the proportion of CKD patients based on complications with the most electrolyte disorders + vascular disorders + anemia with a percentage of 46% and the least hyperlipidemia + electrolyte disorders + anemia with a percentage of 8%.

Table 13. Distribution of the proportion of CKD inpatient based on complications per patient treated at Royal Prima General Hospital Medan in 2020.

Complications	F	%
Anemia + cardiovascular disease	32	32
Cardiovascular disease + hyperlipidemia	14	14
Hyperlipidemia + electrolyte imbalance +anemia	8	8
Electrolyte imbalance + vascular disease + anemia	46	46
Total	**100**	**100**

Table 14. Distribution of the proportion of CKD inpatients by complications treated at Royal Prima General Hospital Medan in 2020.

Complication	f	%
Anemia	86	86
Cardiovascular disease	92	92
Hyperlipidemia	22	22
Electrolyte imbalance	54	54

The distribution of the proportion of CKD patients is based on the length of stay, the shortest is 1-2 days with a percentage of 6%, and the longest is 13-14 days with a percentage of 20%. The distribution of the proportion of CKD patients based on their condition when they returned home was the most outpatient with a percentage of 99%, and only 1% died.

Table 15. Distribution of the proportion of CKD inpatient based on length of stay at Royal Prima General Hospital Medan in 2020.

Length of stay	F	%
1-2 days	6	6
3-4 days	15	15
5-6 days	16	16
7-8 days	11	11
9-10 days	15	15
11-12 days	17	17
13-14 days	20	20

This study is in line with the study which stated that the most CKD patients were in the age range > 56 years with a percentage (46.51%), followed by the 46-55 year age group with a percentage (30.23%), the 36-45 year age group with percentage (11.62%), age group 26-35 years with a percentage (8.13%) and the lowest in the age group 18-25 years with a percentage (3.48%).[6]This is caused by the age factor, where CKD is a progressive and irreversible kidney function disorder in which the kidneys fail to maintain metabolism and fluid and electrolyte balance, which causes uremia (retention of urea and other nitrogenous wastes in the blood).[7] CKD is characterized by an irreversible decline in kidney function to a degree or degree that requires permanent renal replacement therapy in the form of dialysis or kidney transplantation. It can be seen that the sexes most affected by CKD in adults are men with the highest percentage of 63.0%, while the lowest is women with the lowest percentage of 37.0%. [6,7]

Based on the chief complaint, the results showed that the most were shortness of breath (43%), while the lowest was fever (23%). A previous study stated that some of the symptoms that CKD patients complain about are pulmonary disorders, namely shallow breathing, coughing, and sputum. Another study found that among the research samples, there were CKD patients who had cough complaints but had not received cough therapy, namely ambroxol. Furthermore, additional complaints, namely fever, itching, nausea, and cramps, all had the same percentage of 10.71%. Meanwhile, on laboratory examination, it can be seen that laboratory investigations are the most affected by CKD in adults, namely routine blood examination + blood sugar levels + electrolytes + urea + creatinine and radiology with a percentage proportion of 70.0%. At the same time, the least is complete blood + urea + creatinine, with a percentage proportion of 8%.

This study is by the theory that kidney damage can occur in the parenchyma, large blood vessels, or tubule collecting ducts which are most often used as markers of kidney tissue. These markers can provide clues about possible damage to the kidneys and clinical findings that cause kidney disease: 1. Proteinuria is characterized by an increase in the amount of protein in the urine. Proteinuria causes loss of plasma protein due to increased glomerular permeability to protein, inadequate tubular protein reabsorption, and increased plasma protein concentration. Proteinuria may indicate protein loss in the kidneys and lower urinary tract. [2] Albuminuria, Albumin is a type of plasma protein found in the urine in small amounts and substantial amounts in patients with kidney disease. Albuminuria refers to an abnormal increase in albumin in the urine. Several reasons for focusing more on albuminuria than proteinuria are that albumin is the main urine protein component in most kidney diseases. Epidemiological data from studies around the world show a strong relationship between

the amount of urine albumin and the risk of kidney disease and CVD and the classification of kidney disease based on the level of albuminuria. Albuminuria is a common finding but does not all suggest CKD. The presence of albuminuria indicates the presence of glomerular disease, which generally appears before a reduction in GFR. Albuminuria can be associated with hypertension, obesity, and vascular disease where the underlying renal disease is unknown. The rate of albumin and protein loss is generally called the AER (albumin excretion rate) and PER (protein excretion rate). AER limit 30mg/24 h persisting for >3 months to indicate CKD. This limit is approximately equivalent to the ACR in a random urine sample of 30mg/g or 3mg/mmol.[3] Abnormal urine sediment, Findings such as cells, crystals, and microorganisms can appear in urine sediment in various kidney and urinary tract disorders. However, the findings of renal tubular cells, red blood cells (RBC), white blood cells (WBC), coarsely granular, wide cast, and multiple red cell dysmorphic cells are pathognomonic kidney damage.[5] Electrolyte and other abnormalities due to tubular disorders, electrolyte abnormalities can occur due to abnormalities of renal tubular reabsorption and secretion. Often the disease is genetic with no underlying pathological abnormality. Other diseases are acquired due to drugs or poisons and usually with prominent tubular pathological lesions.[8]

In the case of CKD, the administration of furosemide which is a "loop or high ceiling diuretic," can inhibit Na+/K+/Cl- cotransport from the lumen membrane in the ascending loop of Henle so that Na+/K+/Cl- reabsorption decreases. Loop diuretics act rapidly even among patients with impaired renal function or who do not react to thiazides or other diuretics.[9] Bicarbonate is an antacid that is a weak base that reacts with stomach acid to form water and salt, thereby eliminating gastric acidity. These drugs also have other effects, such as reducing H. pylori colonization and stimulating prostaglandin synthesis. Antacids vary widely in chemical composition, acid-neutralizing ability, sodium content, taste, and price.[10] The acid-neutralizing ability of an antacid depends on the capacity to neutralize gastric HCl and whether the stomach is full or empty (food slows gastric emptying, allowing the antacid to work for a longer time).[10,11] One of the most common complications of chronic kidney disease is renal osteodystrophy.

Management of renal osteodystrophy is carried out by overcoming hyperphosphatemia and administering the hormone calcitriol. Management of hyperphosphatemia includes restriction of phosphate intake, administration of phosphate binders to inhibit phosphate absorption in the gastrointestinal tract, and dialysis. The provision of a low-phosphate diet is in line with the diet in patients with CKD in general, which is high in calories, low in protein, and low in salt because phosphate is mainly contained in meat and animal products such as milk and eggs. Phosphate intake is limited to 600-800 mg/day.[5-7] Patients are given CaCO3, which is a phosphate binder. The most commonly used phosphate binders are calcium salts, aluminum hydroxide, and magnesium salts.[12] Fluid and electrolyte restriction should be performed in patients with chronic kidney disease. This aims to prevent the occurrence of edema and cardiovascular complications. The water that enters the body is balanced with the water that goes out, both through urine and Insensible Water Loss (IWL), assuming that the water that comes out through the IWL is between 500-800 ml/day. The electrolytes to watch out for are potassium and sodium intake. Potassium restriction is performed because hyperkalemia can lead to fatal cardiac arrhythmias. Therefore, the administration of drugs containing potassium and foods high in potassium (such as fruits and vegetables) should be limited. The recommended potassium level is 3.5-5.5 mEq/lt. Sodium restriction is intended to control hypertension and edema.

Based on the theory, various complications can be experienced by patients with CKD, including anemia, bone disorder, and mineral balance disorders, inflammation, and dyslipidemia. Prevention and management of various complications are critical in CKD patients. Inadequate management of CKD patients and the various accompanying conditions comprehensively can reduce the quality of life and

increase mortality in patients.[5,6] In late-stage CKD, mortality from cardiovascular disease is 10 to 30 times higher than in the average population. One of the most feared complications of CKD is coronary heart disease. Two factors that have contributed to the formation of atheroma in patients with chronic renal failure are inflammation and calcification of blood vessel walls. This research is supported by a theory that states that a high level of family support is expected to influence the patient's behavior to be more enthusiastic, and motivated and pay more attention to how vital dietary compliance is. Adherence to a good diet by CKD sufferers will have an impact on the prognosis and course of CKD disease in a better direction.[12]

4. Conclusion

It was found that the highest age group was 57-65 years, as much as 37.0%, and men as much as 27%. The chief complaint was shortness of breath at 43% and additional complaints, the most of which were fever + low back pain + edema at 38%. On physical examination, most of the inspections were weak, 55%. Most palpation was sociable 57%. There was auscultation of four abdominal regions and normal positive bowel sounds (93%). Complete blood count + blood sugar level + electrolytes + urea + creatinine 70%, the most combination medication is NaCl 0.9% + Furosemide injection 31%. Based on the length of stay, the longest was 13-14 days (20%).

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