

The 8th Asian Conference on Clinical Pharmacy: "Toward Harmonization of Education and Practice of Asian Clinical Pharmacy"

**EVALUATION OF ANGIOTENSIN RECEPTOR BLOCKERS ON  
PATIENT WITH CHRONIC RENAL FAILURE HOSPITALIZED  
IN DR. SARDJITO HOSPITAL YOGYAKARTA- INDONESIA  
ON 2006**

Woro Harjaningsih  
Dian Sulistiasih

Division of Pharmacology and Clinical  
Pharmacy Faculty of Pharmacy Gadjah Mada  
University, Yogyakarta – Indonesia

## Background

- Chronic Renal Failure (CRF) is defined as abnormality of renal function marked with presence of protein in urine (proteinuria) and degradation of renal function for 3 months or more that is progressive to end stage renal failure.
- Angiotensin Receptor Blocker (ARB) is one of drugs of choice on CRF used to reduce blood pressure and proteinuria levels, retard CRF progression and diminish risk of cardiovascular disease.
- It is used either in single or combination administration with other antihypertension agents

### **The objective of study**

- to evaluate use of ARB on patient with CRF hospitalized in Dr. Sardjito Hospital on 2006.
- The research included pattern of use of ARB on CRF patient and appropriateness based on NKF-K/DOQI 2002 and other literature related to appropriateness in patient, drug, dosage and its effect in reducing blood pressure and proteinuria level

### **The analysis of study**

This research used descriptive evaluative design and collection of data was carried out retrospectively from medical record's patient.

## **Result & Discussion**

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The result of study

amount of patients who get ARBs prescribing on January – December 2006 are 60 patients (67 cases)

a. Characteristic of patient based on gender

gender	amount (patients)	Percentage (%)
man	37	61,67
woman	23	38,33

- Many studies showed that CRF more progressively in the man than in the woman.
- The study on rats showed that the women have estrogen and progesteron hormones which act as nephroprotective agents (Neugarten et al, 2000).

b.Characteristic patient based on age

No	Age (years old)	Amount (patients)	Percentage (%)
1	19 - 40	16	26,27
2	41 - 65	40	66,67
3	>65	4	6,66

- 41-65 years old groups : high risk (highest percentage)  
There are decreasing of renal function cause they more sensitive to CRF progression
- >65 years old groups : lowest percentage because there are may increase patient mortality

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Pattern of Antihypertension agents combined with ARBs

No	Type of antihypertension agents	Amount of cases	Percentage (%)
1	Noperten (lisinopril)	1	1,56
2	Lasix (furosemide)	17	26,56
3	Adalat oros (nifedipine)	7	10,94
4	Lasix (furosemide) + captopril	1	1,56
5	Lasix (furosemide) + Adalat oros (nifedipine)	17	26,56
6	Lasix (furosemide) + Noperten (lisinopril)	7	10,94
7	Noperten (lisinopril) + Adalat oros (nifedipine)	1	1,56
8	Lasix (Furosemide) + captopril + Noperten (lisinopril)	1	1,56
9	Lasix (furosemide) + Adalat oros (nifedipine) + Noperten (lisinopril)	12	18,75
	Total	64	100

Evaluation of appropriateness in patient

Potassium level (mEq/L)	Amount of cases (%)	Amount of cases (%)	Amount of cases (%)
	Appropriate	Not appropriate	Unknown
< 5,5	42	-	
> 5,5	2	20	
Total	44	20	3
Percentage (%)	65,67	29,85	4,48

- The appropriateness in patient is if no contraindication with ARB prescribing i.e hyperkalaemia condition (serum potassium concentration (K+) > 5,5 mEq/L)
- There are 2 cases in group of **Appropriate** but they have potassium level >5,5 mEq/L. This is caused by ARB prescribing in the groups carried out after management of hyperkalaemia condition (potassium level up to normal range : 2,8 and 5,2 mEq/L)

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Evaluation of appropriateness in drug

- The result of study showed that appropriate ARBs prescribing on CRF patients is 100% because ARBs prescribing is safe.
- ARBs is not safe if it combined with potassium – thript diuretic (such as: spironolactone) because can aggravate hyperkalaemia risk.

Evaluation of appropriateness in dosage

Type of ARBs	Dosage (mg)	Dosage recommended by NKF-K/DOQI (mg/day)	Dosage appropriate	Dosage inappropriate
irbesartan (Aproval)	1 X 300 mg	150 – 300	63 cases	-
Irbesartan (Aproval)	1 X 150 mg	150 - 300	4 cases	-
Total (%)			67cases (100%)	0%

- Dosage of ARBs have been appropriated (100%) with NKF-K/DOQI recommendation

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Evaluation of ARBs effect on Blood Pressure (BP)

Effect on BP	Percentage of case (%)
BP reached the target accepted range	29,85
BP decreased but it did not reach the target accepted range	44,78
BP did not change or increased	25,37
Total	100

- NKF-K/DOQI stated that ARBs effect on decreasing of blood pressure is equal to ACEI (ACE Inhibitor).
- Some case in this study did not reach the target accepted range, this may caused by several factors, such as : non compliant patient, pathophysiology or comorbid condition, diet, etc.
- That factors have not known yet by researcher because the study carried out retrospectively.

Evaluation of ARBs effect on proteinuria level

- Majority of cases in the study (39 cases/58,21%) did not record proteinuria levels hence the study can't evaluate ARBs effect on decreasing of proteinuria levels.

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Conclusion

1. Amount of ARBs prescribing on CRF hospitalized in Dr. Sardjito Hospital Yogyakarta, Indonesia on 2006 was 67 cases (38,81%) from 60 CRF patients. Pattern of ARBs prescribing were 64 cases (95,54%) in combination therapy and 3 cases (4,47%) in monotherapy.
2. Evaluation of ARBs prescribing showed :
  - a. Evaluation of appropriateness in patient showed that 67,67% was patient appropriate, 29,85% was patient inappropriate, and 4,48% was unknown.
  - b. Evaluation of appropriateness in drug based on NKF-K/DOQI showed that 100% was drug appropriate.
  - c. Evaluation of appropriateness in dosage showed that 100% have been appropriated with NKF-K/DOQI recommendation,i.e dosage range : 150 – 300 mg/day.
3. Evaluation of ARBs on blood pressure effect showed :
  - a. Patients who have blood pressure reached the target accepted range were 29,85%.
  - b. Patients who have blood pressure decreased but did not reach the target accepted range were 44,78%.
  - c. Patients who have blood pressure did not change or increased were 25,37%.

Thanks you

### c. Characteristic patient based on etiology of CRF

etiology	amount of cases	Percentage (%)
Chronic glomerulonephritis	21	31,40
Diabetic nephropathy	14	20,90
Uropaty obstructive	9	13,40
Multicystic renal	3	4,50
Unknown	20	29,80
Total	67	100,00

- The result of study appropriate with NKF-K/DOQI stated that the most of renal disease' etiology is non diabetic disease such as chronic glomerulonephritis, vascular disease (hypertension, renal artery disease, etc), tubulointerstitial disease (urinary tract infection, renal stone), and cystic disease (multicystic renal disease).

### d. Characteristic patient based on complication of CRF

Type of complication	Amount of cases (%)	
	With complication	Without complication
anaemia	62 (92,54%)	5 (7,46%)
hypoalbuminaemia	39 (58,21%)	28 (41,79%)
hyperuricemia	20 (29,85%)	47 (70,15%)
hyperkalaemia	20 (29,85%)	47 (70,15%)
hyponatremia	14 (20,89%)	53 (79,11%)
acidosis metabolic	5 (7,46%)	62 (92,54%)

- Anaemia is the highest of CRF complication caused by erythropoietine deficiency. This is appropriate with NKF-K/DOQI.

g. Characteristic patient based on Renal Replacement Therapy (RRT)

Type of RRT	Amount of cases	Amount of cases	Amount of cases	Amount of cases
	Non diabetic	Non diabetic	Diabetic	Diabetic
	Sr Cr	Sr Cr	Sr Cr	Sr Cr
	<8 mg/dL	>8 mg/dL	<6 mg/dL	>6 mg/dL
Hemodialysis/ HD	4	21	2	9
CAPD	-	1	-	-
Not HD/CAPD	3	6	4	4
Total	7	28	6	13
Percentage	20%	80%	31,58%	68,42%

Suggestion

- Suggestion for next study were :
  1. Should be carried out study about evaluation of ARBs prescribing prospectively hence side - effect of drug and drug interaction could be monitored.
  2. Should be carried out study about evaluation of other antihypertension agents on CRF patients.
- Suggestion for Dr. Sardjito Hospital :
  1. Should be used guideline more complete about management of CRF as guideline for Dr. Sardjito Hospital.
  2. Should be written medical record completely about side - effect of drug.
  3. Should be written medical record well, regulated nicely and easy to read.

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Evaluation of out of hospital condition

Out of hospital condition	Amount of cases	Percentage (%)
Improve	37	55,22
Not cure	7	10,45
Die	2	2,99
No information	21	31,34
Total	67	100

Operational definition of variable

- Pattern of drug use is model or description of ARB prescribing which include : type of drug, dosage or dosage form, and drug combination
- Patient is CRF patients hospitalized with ARB prescribing
- Case is CRF patients hospitalized with ARB prescribing with once hospitalized
- The appropriateness in patient is if no contraindication with ARB prescribing i.e hyperkalaemia condition (serum potassium concentration (K+) > 5,5 mEq/L)
- The appropriateness in drug is if no interaction with other antihypertension agent based on literature
- The appropriateness in dosage is if ARB dosage appropriate with dosage recommended by NKF-K/DOQI 2002 guidelines

*Problems of study*

- What is pattern of use of ARB on patient with Chronic Renal Failure hospitalized in Dr Sardjito Hospital on 2006 ?
- What is appropriateness of ARB based on NKF-K/DOQI 2002 and other literature related to appropriateness in patient, drug and dosage ?
- What is effect of ARB in reducing blood pressure and proteinuria levels?

*d. Characteristic patient based on proteinuria level*

Proteinuria level	Amount of cases	Percentage (%)
+1 (100 mg/100 mL urinary)	7	10,45
+2 (200 mg/100	6	8,95
+3 (300 mg/100 mL urinary)	11	16,42
+4 (1g/100 mL urinary)	4	5,97
No information	39	58,21
Total	67	100

- Majority case (39%) in this study have no information about proteinuria level whereas proteinuria is a marker for renal failure.

e. Characteristic patient based on Serum Creatinine level

Serum Creatinine (Sr Cr) level	Percentage (%)
< 3,0 mg/dL	1,5
> 3,0 mg/dL	98,5
Total	100

- Increasing of serum creatinine level became two fold from normal/target accepted range mean 50% section of renal has been damaged (NKF/K-DOQI).
- Based on high serum creatinine level showed that renal abnormality in majority of patient was serious (> stadium 4).

f. Characteristic patient based on value of Glomerulus Filtration Rate/ GFR)

\*measuring of GFR used Jellife Formula.

Stadium	GFR (mL/men/1,73 m <sup>2</sup> )	Amount of cases	Percentage (%)
1	≥ 90	-	-
2 (Mild ↓GFR)	60 - 89	-	-
3 (Moderate ↓GFR)	30 - 59	1	1,49
4 (Severe ↓GFR)	15 - 29	3	4,48
5 (Kidney Failure)	< 15 (or dialysis)	63	94,03
	Total	67	100

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Evaluation of appropriateness in dosage as combination therapy

Type of antihypertension agent	Dosage in monotherapy (mg/day) (NKF-K/DOQI, 2002)	Dosage in combination
Lasix (furosemide)	20 - 80	1 X 40 mg 1 Ampul /12 hours
captopril	25 - 150	3 X 25 mg
Noperten (lisinopril)	20 - 40	1 X 10 mg
Adalat oros (nifedipin)	30 - 60	1 X 30 mg

- Dosage of other anti hypertension agent combined with ARBs have been appropriated with NKF-K/DOQI recommendation.