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Acute Renal Insufficiency in Young Men with Plasmidium Vivax Malaria in Korea

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Background : Plasmodium vivax (P. vivax) malaria accounts for more than half of all malaria cases in Asia and Latin America. Despite the high prevalence of disease caused by this parasite, research into its effects (especially renal effect) has lagged disproportionately. We analyzed the cases of vivax- malaria induced renal insufficiency in young Korean men.

Methods : This is retrospective analysis of P. vivax patients with acute renal insufficiency (all males, n=75), defined by estimated glomerular filtration rate (eGFR) <80 mL/min (group1, n=31) or proteinuria (group 2, eGFR ≥80 mL/min, n=44), between January 2004 to December 2007. eGFR was calculated using simplified Modification of Renal Disease (MDRD) equation. All of the patients had no histories of traveling abroad, drug abuse or blood transfusion. The clinical manifestation, laboratory abnormalities and risk factors of renal insufficiency were reviewed.

Results : Out of 398 cases of vivax malaria, 75 patients (all males) were related to vivax malaria- induced acute renal insufficiency. The mean age of the patients of 2 groups was 22.8± 3.7 years and 21.6±1.8 years, respectively (p=0.089). In group 1, total bilirubin significantly correlated with creatinine and eGFR (p=0.004 and 0.035, correlation coefficient=0.508 and - 0.387, respectively). In group 2, 24 hour proteinuria significantly correlated with hemoglobin (p=0.004, correlation coefficient= - 0.424).

Conclusion : Total bilirubin (group 1, eGFR <80 mL/min) and hemoglobin (group 2, eGFR ≥80 mL/min and proteinuria) are useful to predict vivax- induced renal insufficiency.

Key Words : 삼일열 말라리아, 신기능부족, 단백뇨, 빌리루빈, 혈색소
Vivax malaria, Renal insufficiency, Proteinuria, Bilirubin, Hb

Table 1. The Clinical and Laboratory Characteristics of the 75 Study Patients (all males) on Admission

	Group1 (GFR < 80 n = 31)	Group2 (GFR ≥ 80, n = 44)	*P*-value
Age (years)	22.8 ± 3.7	21.6 ± 1.8	0.089
WBC (/μL)	4573 ± 984	3884 ± 984	0.004
Hemoglobin (g/dL)	12.9 ± 2.3	11.8 ± 1.4	0.018
Platelet (/μL)	70709 ± 36286	64954 ± 29273	0.450
BUN (mg/dL)	16.3 ± 8.9	14.8 ± 3.9	0.314
Cr (mg/dL)	1.46 ± 0.37	0.96 ± 0.10	< 0.001
GFR by MDRD (mL/min)	66.3 ± 10.9	106.2 ± 15.0	< 0.001
AST (IU/L)	45 ± 44	60 ± 50	0.188
ALT(IU/L)	59 ± 110	82 ± 89	0.336
Total Bilirubin (mg/dL)	1.96 ± 1.43	1.77 ± 0.78	0.518
Total protein (g/dL)	6.6 ± 0.8	6.5 ± 0.7	0.462
Albumin (g/dL)	3.9 ± 0.7	3.9 ± 0.5	0.877
Total cholesterol (mg/dL)	115 ± 38	99 ± 28	0.061
Triglyceride (mg/dL)	113 ± 56	108 ± 47	0.655
Sodium (mEq/L)	138 ± 4	141 ± 2	0.002
Potassium (mEq/L)	3.9 ± 0.4	3.9 ± 0.3	0.647
24hour protein (mg/day)	Not tested	193 ± 188	

Data are given as the mean ± SD.

Table 2. Pearson Correlation Coefficients between GFR by MDRD and the Lab Findings

	Group1 (GFR < 80,n = 31)	*P*-value	Group2 (proteinuria ,n = 44)	*P*-value
WBC	-0.151	0.417	-0.145	0.347
Hemoglobin	-0.07	0.706	-0.424	0.004
Platelet	0.321	0.078	-0.128	0.408
BUN	-0.651	< 0.001	0.254	0.096
Creatinine	-0.924	< 0.001	0.108	0.436
AST	-0.201	0.279	0.095	0.538
ALT	-0.021	0.912	0.241	0.115
Total Bilirubin	-0.387	0.035	0.233	0.133
Sodium	0.278	0.153	-0.094	0.544
Potassium	0.120	0.544	0.189	0.219

Data are given as the mean ± SD.

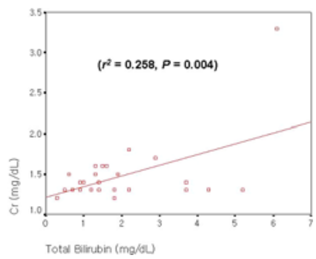

Fig. 1. Distribution of creatinine according to total bilirubin (GFR <80 mL/min).

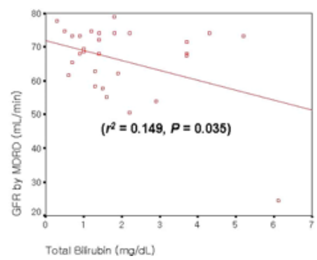

Fig. 2. Distribution of GFR by MDRD according to total bilirubin (GFR <80 mL/min).

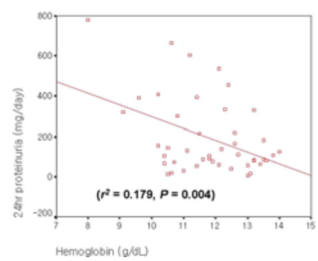

Fig. 3. Distribution of 24 hour proteinuria according to hemoglobin (GFR ≥80 mL/min).