



Comparison of Outcomes of Erythropoietin alpha and Erythropoietin beta for Treatment of Anemia in Children with Chronic Kidney Disease (CKD) on Maintenance Hemodialysis; a Retrospective Cohort Study

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Introduction

Anemia is a common complication of CKD which can be treated with Erythropoietin. This study aims to compare the outcomes of erythropoietin alpha (EPO A) and erythropoietin beta (EPO B) in children on maintenance hemodialysis.

Methodology

Hemodialysis patients aged 12-18 years with hemoglobin ≥ 8 to < 11 g/dL were included, and grouped according to EPO type they received. Successful treatment was defined as achievement of Hb ≥ 11 g/dL within 3 months of treatment and successful maintenance as Hb ≥ 11 g/dL for ≥ 3 months after a successful treatment. The effectiveness and treatment cost of both EPO were compared.

Results

Higher percentage of successful treatment (75% vs 31.2%, $p=0.03$; AOR 0.07 95%CI, 0.01-0.71) and maintenance were observed in EPO B. Lower doses of EPO B were required for successful treatment and maintenance, thus lower cost of EPO B was computed. The median increase of Hb using EPO B was higher after 1st month.

Conclusion

This study has shown that EPO B is more effective than EPO A in the management of anemia. Both EPO have comparable safety profile. This is the first study that directly compares EPO A and EPO B in children. Prospective studies is recommended to verify these findings.

Keywords: chronic kidney disease, pediatric CKD, pediatric, anemia, renal anemia, erythropoietin, erythropoietin alpha, erythropoietin beta, EPO, EPO alpha, EPO beta, epoetin, hemodialysis, HD, maintenance hemodialysis

Comparison of Treatment Outcomes between EPO A and EPO B During Treatment and Maintenance Phase Among Children with CKD on Maintenance Hemodialysis

	Total	EPO A	EPO B	p value
Treatment Phase	N=Total Number of Patients			
	N=32	N=16	N=16	
Successful (%)	17 (53.1%)	5 (31.2%)	12 (75%)	0.03*
Unsuccessful (%)	15 (46.9%)	11 (68.8%)	4 (25%)	
Duration of therapy to achieve successful treatment	N=Number of patients who were successfully treated (%)			
	N=17	N=5	N=12	
1 month	11 (64.7%)	1 (20%)	10 (83.3%)	0.013*
2 months	5 (29.4%)	4 (80%)	1 (8.3%)	
3 months	1 (5.9%)	0	1 (8.3%)	
EPO dose (U/kg/wk) Mean \pm SD		393 \pm 140	208 \pm 151	0.03*
Cost to achieve successful treatment				
No. of injections consumed Median (IQR)		24 (24-24)	12 (8-17)	0.05*
Cost (Php) Median (IQR)		₱11,448.00 (₱11,448.00-₱11,448.00)	₱5,580.00 (₱3,720.00-₱14,880.00)	0.04*
Maintenance Phase	Patients (%) who had successful maintenance out of those who were successfully treated (N)			
	N = 17 (53.1%)	N=5 (29.4%)	N=12 (70.6%)	
Successful (%)	8 (47%)	2 (40%)	6 (50%)	1.0
Unsuccessful (%)	9 (53%)	3 (60%)	6 (50%)	
Duration of successful maintenance	N=Number of patients who had successful maintenance (%)			
	N=8	N=2	N=6	
3 months	4 (23.5%)	1 (50%)	3 (50%)	1.0
≥ 4 months	4 (23.5%)	1 (50%)	3 (50%)	
EPO dose (U/kg/wk) Mean \pm SD		254 \pm 101	124 \pm 44	0.03*
Monthly cost to achieve successful maintenance				
No. of injections consumed Median (IQR)		13 (12-15)	10 (8-14)	0.50
Cost (Php) Median (IQR)		₱6,916.50 (₱6,659.00-₱7,274.00)	₱4,650.00 (₱3,434.00-₱6,510.00)	0.32
Overall monthly cost from successful treatment to successful maintenance	N=Number of successfully treated patients who had successful maintenance			
		N=2	N=6	
No. of injections consumed Median (IQR)		14 (12-15)	10 (8-13)	0.50
Cost (Php) Median (IQR)		₱6,360.00 (₱5,724.00-₱6,996.00)	₱4,650.00 (₱3,434.00-₱6,510.00)	0.50

*Significant P value < 0.05