

Global hemostatic assessment at different target procoagulant activities of factor VIII and factor IX concentrate

Ki Young Yoo, Soo Young Jung, Young-shil Park *

Korea Hemophilia Foundation, * Department of pediatrics, Kyung Hee University Hospital at Gangdong, Kyung Hee University School of Medicine, Seoul, Korea



INTRODUCTION

Based on reports addressing hemophilia B patients bleed less common and less intensively than hemophilia A, it has been expected that the hemostatic level of factor IX (FIX) activity can be lowered than that of factor VIII (FVIII) activity. In Korea, hemophilia B patients have been treated with relatively less amount of factor concentrates. The target procoagulant activity of FVIII is set on 60 IU/dL whereas that of FIX is set on 40 IU/dL.

The aim of this study is to compare the hemostatic efficacy of the current FIX and FVIII dosage which have been practiced in Korea with global hemostatic assay such like thrombin generation assay (TGA), thromboelastography (TEG) and clot-wave form analysis (CWA).

METHOD

A total of 17 severe hemophilia patients without inhibitor, aged more than 15 years old were subjected; 12 hemophilia A patients and 7 hemophilia B patients.

Factor concentrates were injected to reach the target activity of 60 IU/dL in hemophilia A and 40 IU/dL in hemophilia B which is given by Korean health insurance guideline.

All patients were in non-bleeding state and kept the wash-out period of 3 days for hemophilia A and 5 days of hemophilia B.

Before and on 15 minutes after injections, we conducted one-stage factor assay, TGA, TEG and CWA.

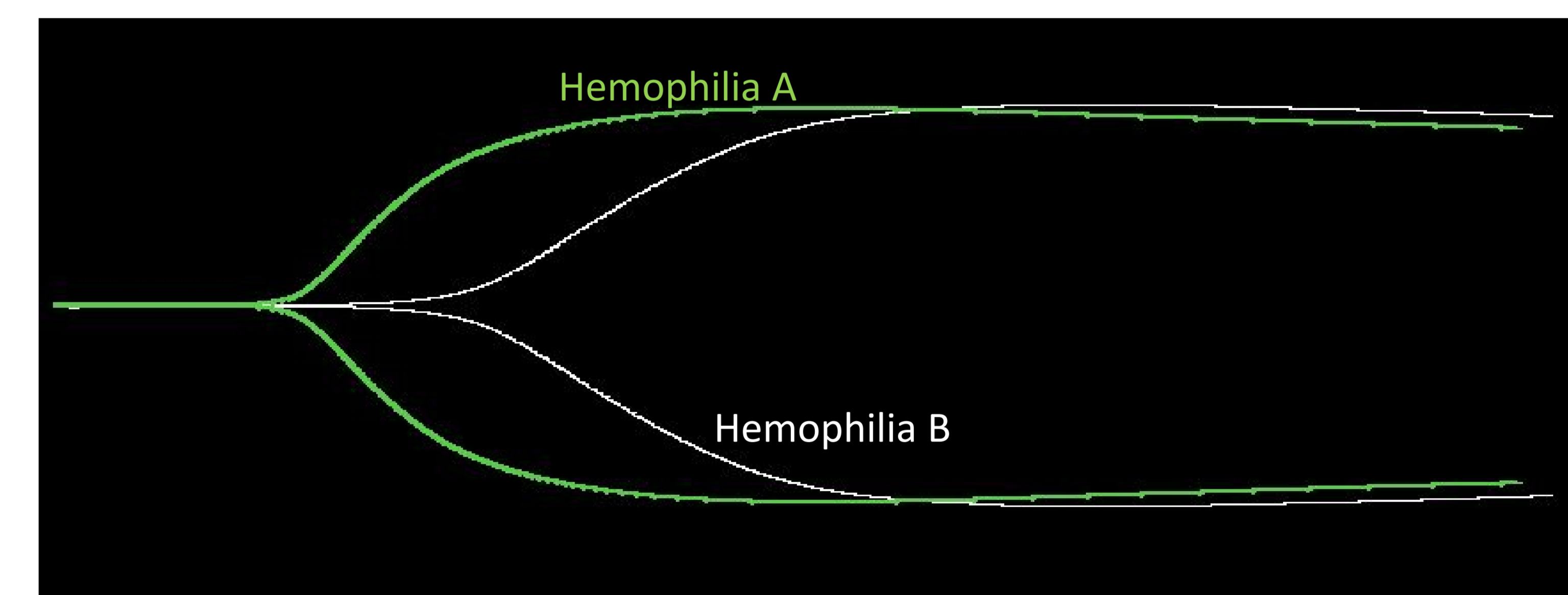
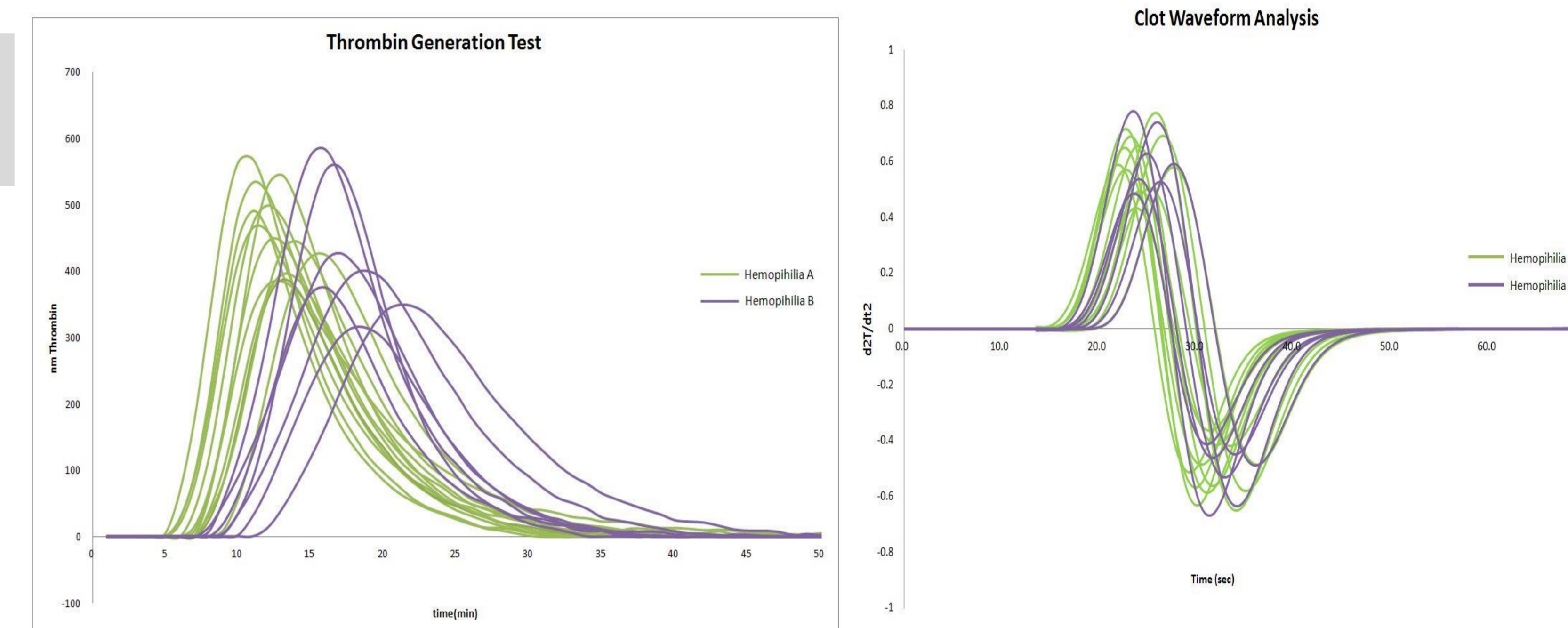
RESULT

Median ages of hemophilia A and hemophilia B patients were 28 and 33 years old. Baseline FVIII:C and FIX:C were 0.6% and 1.8% and they rose after injection rose to 70.8% and 49.8%.

The dosage of FVIII concentrates and recombinant FIX concentrates were 28.4 IU/kg and 50.7 IU/kg. Incremental recovery in hemophilia A and hemophilia B patients recorded 2.43 %/IU/kg and 0.91 %/IU/kg.

Peak thrombin of FVIII and FIX were 451.3 nM and 376.6 nM ($P=0.108$, normal range, 458 nM \pm 60).

TEG index of FVIII and FIX were -1.60 and -3.77 ($P=0.004$, normal range, -2 ~+2). MIN2 of CWA of FVIII and FIX were 0.62 and 0.59 ($P=1.000$).



TEST		Hemophilia A	Hemophilia B
Dosage		28.4 IU/kg	50.7 IU/kg
One stage Assay	Trough	0.6 %	1.8 %
	At 15 mins after Injection	70.8 %	49.8 %
	Incremental recovery	2.43 %/IU/kg	0.91 %/IU/kg
TGA	Peak Thrombin	451.3 nM	376.6 nM
TEG	TEG INDEX	-1.6	-3.77
CWA	MIN2	0.62	0.59

CONCLUSION

Even though incremental recovery of FVIII and FIX are within normal range, less favorable results of peak thrombin, TEG index and MIN2 value in hemophilia B patients indicate lower dosage of factor IX can't achieve the consistent hemostatic effect with factor VIII.

Further studies should be needed to determine the adequate dose of FIX concentrates to make the consistent hemostatic effects comparing the dose of FVIII concentrates.