

Current Status of the Korean Venous Thromboembolism Registry

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The Korean venous thromboembolism (VTE) registry, which was initiated by the Working Parties of Korean Society on Thrombosis and Hemostasis, and the Korean Society of Hematology, is a web-based multicenter registry (<http://kdvt.chamc.co.kr>) for recruiting consecutive VTE patients. The aim of the registry is to prospectively collect data on the epidemiology and clinical outcomes of VTE from a large, unselected cohort of patients, and to provide data on the true incidence and management of VTE in the real-world. By the end of 2007, the starting year of the registry, 840 patients were registered. By the end of 2008, 1,121 were registered, with 1,289 by the end of 2009, and 1,463 by April 2010 from 11 hospitals. The first report on the epidemiologic characteristics of 596 consecutive VTE patients was released in October 2007.

Key Words: Venous thromboembolism, registry, Korean

VTE IN KOREA

Venous thromboembolism (VTE) is the third most common cardiovascular disease after myocardial infarction and stroke.¹ More than 600,000 cases of VTE occur annually in the United States of America, and 50,000 deaths due to pulmonary embolism.² The annual mortality from VTE surpasses the sum of the mortalities from breast cancer, prostate cancer, AIDS and traffic accidents in Europe.³ The incidence of VTE in Koreans has been generally found to be lower than Caucasian, but it appears to be rapidly increasing, possibly because of the widespread adoption of a westernized life style⁴ and increased awareness of VTE among physicians and the community. Therefore, it is to raise awareness of this health issue to reduce mortality from VTE.

VTE REGISTRY IN KOREA AND ITS CURRENT ACTIVITIES

In order to promote the study on the epidemiology, clinical and basic research of VTE in Koreans, the Korean Society of Hematology (KSH) and Korean Society

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on Thrombosis and Hemostasis (KSTH) organized the working party on VTE in October 2005 and 2006, respectively. Because the core members of both working parties are basically similar, the working party was termed “The KSH/KSTH-Deep Vein Thrombosis Working Party (KSH/KSTH-DVTWP)”. Since the registry includes pulmonary embolism (PE) in addition to DVT, its name was changed to “The KSH/KSTH VTE Working Party (KSH/KSTH-VTEWP)” in 2009. It is a web-based, multicenter registry (<http://kdvt.chamc.co.kr>) recruiting consecutive VTE patients from 11 teaching hospitals.⁴ Patient enrollment began since January 1, 2007, and the registry is the largest registry on VTE in Korea. The aim of the registry is to prospectively collect data on the epidemiology and clinical outcomes of VTE from a large unselected cohort of patients and to provide the data on the true incidence and management of VTE in the real-world.

By the end of the first year, 840 patients with VTE were registered from nine initial university hospitals. A total of 1,121 were registered by the end of 2008, 1,289 by the end of 2009, and 1,463 by April 2010 from 11 hospitals. The first report on the epidemiologic characteristics of 596 consecutive VTE patients was released in October 2007. The proportions of patient over 50 years old was 76% among the 596 VTE patients. VTE developed more frequently in women than men. Major risk factors for VTE were old age, cancer, immobilization, surgery, severe medical disease, stroke, and trauma. In 28% (158/596) of the patients, VTE was idiopathic. Cancer was associated with VTE in 24% (134/596) and cancer was detected after diagnosis of VTE in 4% (24/596). Cancer-associated DVT frequently occurred was developed in an atypical location more frequently than DVT without cancer ($p=0.0465$). PE was more frequently associated with idiopathic VTE than secondary VTE

($p=0.014$) (Table 1). Using the registry, clinical epidemiologic research on metabolic syndrome⁴ and cancer patients⁵ were carried out. The activation of the registration has enabled participating clinicians to manage their VTE patients according to the international standard of care on VTE, and resulted in qualitative improvement in diagnosis and treatment of VTE. These include rapid and accurate diagnosis by early use of compression ultrasonography (CUS) and pulmonary CT angiogram, home treatment using low molecular weight heparin (LMWH), careful use of thrombolysis or IVC filter insertion, use of dosing nomogram for VKA-, and adoption of the updated ACCP guidelines, among other things. The registry also enables stratification of risk groups on diagnostic timing. Increased detection of VTE patients by the activation of the registry made it possible to carry out large clinical trials. Since March 2008, international clinical trials such as RECOVER-II (NCT00680186), RESONATE (NCT00329238), MAGELLAN (NCT00571649), and HOKUSAI (NCT00680186) have been carried out in Korea and the number is increasing. Clinical studies using therapeutic or preventive devices or diagnostic reagents will also be applicable soon.

ACTIVITIES OF VTE REGISTRY IN WESTERN COUNTRIES

Many registries and databases several of which enroll VTE patients exclusively, such as Worcester DVT Study,² Rochester Epidemiology Project,⁶ Brigham and Women’s hospital DVT Registry,⁷ California Patient Discharge Data,⁸ Malmo DVT Study,⁹ Nord-Trondelag VTE Study,¹ Study of Men Born in 1913,¹⁰ Swedish Inpatient Registry,¹¹ Bretagne

Table 1. Characteristics of Korean Patients with Idiopathic Venous Thromboembolism

	Secondary VTE (n=401)	Idiopathic VTE (n=158)	<i>p</i> value
Mean age	61	59	0.08
M : F	170 : 231	71 : 87	0.65
Types of VTE			0.01
DVT	181	59	
DVT+PE	133	46	
PE	87	53	
Sites of DVT			0.01
Left limb	148	67	
Right limb	95	20	
Both limb	30	5	
Abdominal cavity	19	3	
Upper limb	4	1	

VTE, venous thromboembolism; DVT, deep vein thrombosis; PE, pulmonary embolism.

VTE Study,¹² French Multicenter VTE Registry,¹³ CHS/ARIC Study,¹⁴ Danish National Patient Registry,¹⁵ VERITY,^{16,17} MASTER,¹⁸ and Registro Informatizado de la Enfermedad Tromboembolica (RIETE),^{19,20} have been used to study different aspects of VTE. The most active and largest registry is the RIETE in which 24,000 VTE patients from 186 hospitals in 13 countries have been registered since March 2001. The success of this registry gives insight for the future of our registry.

PUBMED search on RIETE reveals that 55 clinical studies have been published since 2004, 3 years after initiation of the registry. Since the activation of the RIETE in March 2001, 6,160 patients had been registered by the end of 2003. The first series of publications was published in the *New England Journal of Medicine* on recurrent VTE,^{20,21} different outcomes in acutely ill medical versus surgical patients with VTE,²¹ and management pattern of VTE in the registry.²² The incidences of fatal PE, fatal bleeding, and major bleeding were significantly higher in acutely ill medical patients compared to surgical patients, suggesting that thromboprophylaxis is necessary in acutely ill medical patients. In 2005, patients with VTE and recent major bleeding prior to VTE diagnosis were studied and found to have poorer clinical outcomes compared with those who had not experienced recent major bleeding.²³ Study of the influence of overweight,²⁴ and early ambulation in the treatment of VTE demonstrated no influence of extreme overweight and bed rest in patients presenting with acute VTE.²⁵

In 2006, markers of poor prognosis in acute VTE patients were investigated. Bilateral DVT, renal insufficiency, body weight <70 kg, recent immobility, chronic heart failure, and cancer were associated with an increased risk for adverse events.²⁶ In VTE patients aged 80 years or older, there is more concern about fatal PE than about bleeding.²⁷ The relationship between cancer and VTE was extensively studied,²⁸⁻³³ and abnormal renal function, metastatic disease, recent major bleeding and recent immobility for 4 days or more have been shown to be associated with an increased risk for both fatal PE and fatal bleeding. VTE in atypical location such as upper extremity,^{32,34} VTE in renal insufficiency,³⁵ and VTE in pregnancy, postpartum, or with contraceptive use^{36,37} were also investigated.

FUTURE PERSPECTIVES

Maintenance of good quality, secure data and future-orient-

ed studies will be necessary for vitalizing our registry. Because the ultimate goal of VTE study is the improvement in the quality of management, we hope that our registry will be applicable in the development of new drugs and diagnostic reagents or devices.

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