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Editorial

Editorial: Resolution of left atrial thrombus with novel oral anticoagulants

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Atrial fibrillation (AF) is often accompanied by thrombus in the left atrium (LA). This thrombus causes thromboembolic complications. Thus, warfarin has been used for prevention of thromboembolic complications in patients with AF aiming for resolution of LA thrombus [1,2]. The Japanese guidelines set different target prothrombin time-international normalized ratios (PT-INRs) for patients taking warfarin: 1.6–2.6 for elderly patients (≥70 years) and 2.0–3.0 for younger patients (<70 years); discordance between guideline recommendations and real-world clinical practice is indicated [3]. It has been reported that major bleeding is observed at PT-INR values above 2.5 on warfarin anticoagulation [1].

Rivaroxaban is a direct factor Xa inhibitor and belongs to the class of novel oral anticoagulants (NOACs). Rivaroxaban is reported to be as efficacious as warfarin in prevention of stroke or systemic embolism and may cause less bleeding [4]. Relatively few reports are available regarding the resolution of LA thrombus with NOACs [5–7].

In this study the authors report a case of an 89-year-old man who showed AF and a mobile thrombus of 28.6 mm × 20.8 mm in the LA [8]. With the administration of rivaroxaban (10 mg/day) the thrombus reduced its size and disappeared completely after 2 weeks of rivaroxaban treatment. Because rivaroxaban successfully dissolved LA thrombus during a short period, the authors even suggest that rivaroxaban might have the potential to dissolve established thrombi by direct inhibition of free and thrombus-bound coagulation factor Xa in addition to preventing de novo thrombus formation. The favorable effect of rivaroxaban therapy on the resolution of LA thrombus provides clinically important implications of NOACs aimed at resolving thrombus and preventing thrombus complications.

Formation and resolution of thrombus are based on the balance between coagulation and fibrinolysis. Rivaroxaban inhibits free factor Xa and prothrombinase activity, and blocks thrombin generation in a concentration-dependent manner [9], shifting this balance to fibrinolysis. Reduced thrombin generation contributes to a loose fibrin clot degradable by profibrinolytic activity [10]. These phenomena may induce the LA thrombus resolution. The dose of rivaroxaban (10 mg) adopted in this case is low as compared with that in the ROCKET AF (rivaroxaban once daily oral direct factor Xa inhibition compared with vitamin K antagonist for prevention of stroke and embolism trial in atrial fibrillation) study (20 mg once daily) [11]. However, a low dose of rivaroxaban (10 mg once daily) is approved for patients with renal dysfunction in Japan, and is effective in the resolution of thrombus. This dose is also consistent with the dose conducted in the Japanese population (the Japanese-ROCKET AF study) [4].

Unfortunately the changes in laboratory data for the coagulation and fibrinolytic parameters after rivaroxaban treatment were not available in this report. We would like to know in this study whether soluble fibrin and D-dimer levels decreased along with resolution of LA thrombus without prolongation of PT-INR and activated partial thromboplastin time. Clearly, further clinical studies are required on this point. Wada et al. [12] reported that soluble fibrin and D-dimer levels are useful for diagnosis of thrombosis. Monitoring of fibrin-related markers such as soluble fibrin and D-dimer may be helpful in elucidating the mechanism of favorable effects of NOACs in AF patients. Rivaroxaban treatment enabled thrombus resolution within a short time. Thus, this NOAC may have significant roles in rhythm control strategies among similar cases. It is undoubtedly important to investigate further in a large population whether rivaroxaban and other NOACs are useful in resolving LA thrombus.

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