Patients with recurrent Venous Thromboembolism (VTE) have less elastic clots than those with non-recurrent VTE

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Objective – Venous thromboembolism (VTE) is a life threatening disease often leading to recurrent events years after the initial episode. The aim of this study was to determine the difference in plasma clot mechanical properties from patients having recurrent versus non-recurrent VTE.

Methods and Results – We have previously developed a system for determining clot mechanical properties using an in house Magnetic Tweezers system. This system was used to determine the mechanical properties of platelet poor plasma clots made from 45 patients with either recurrent or non-recurrent VTE. Plasma samples were mixed with micrometre sized beads followed by thrombin and calcium to induce clotting, then placed in small capillary tubes and allowed to clot overnight. Bead displacement upon manipulation with magnetic forces were analysed to determine clot elasticity (G’) and viscosity (G”). Recurrent VTE patients had nearly two-fold less elastic (0.40 (0.29 – 0.46) vs 0.69 (0.55 – 1.03), G’ at 1 Hz, presented as median (interquartile)) and less viscous (0.38 (0.22 – 0.45) vs 0.69 (0.47 – 0.98), G” at 1 Hz) clots than those with recurrent VTE, regardless of male sex, unprovoked events, family history of VTE, fibrinogen concentration or BMI.

Conclusions – Clots from patients with recurrent VTE were less elastic and less viscous than those from patients with non-recurrent VTE. These data indicate a possible role for fibrin clot elasticity in determining VTE recurrence.

I, Stephen R. Baker would like to apply for the Outstanding Abstract Award.

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