The argument against everyone with hyperosmolar hyperglycaemic syndrome being given prophylactic treatment dose anticoagulation

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In this edition of the journal, Sim *et al* have written a case report of a 63-year-old man with type 2 diabetes admitted with hyperosmolar hyperglycaemic syndrome (HHS) who developed extensive venous thromboembolic disease (VTE). The authors carried out a literature review and suggest that "If a person is deemed to be at high risk of thrombosis, full dose anticoagulation should be given". This suggestion is correct and we would discourage the use of full dose anticoagulation as the standard of care for everyone presenting with HHS. This subject has been debated in these pages before.[1]

Recent data have confirmed that people with diabetes are at increased risk of developing VTE.[2] It has also been recognised that, in HHS, arterial and venous thromboembolic disease is more common than in those with diabetes,[3,4] but also more common than in those who present with diabetic ketoacidosis (DKA).[3,5,6] It may well be due to the hypernatraemia or raised vasopressin concentrations, which are recognised as thrombogenic.[7] Hyperglycaemia per se is also associated with a pro-inflammatory effect on the endothelium, which improves with insulin therapy.[8] However, these data are not consistent, with some authors suggesting that the risk of VTE in those with diabetes and hyperosmolarity is similar – or only marginally above – those with other conditions such as sepsis, acute renal failure or acute connective tissue disease.[9,10]

The original HHS guideline from the Joint British Diabetes Societies for Inpatient Care (JBDS) said the following:

> *"All patients should receive prophylactic low molecular weight heparin for the full duration of admission unless contraindicated … Full anticoagulation should only be considered in patients with suspected thrombosis or acute coronary syndrome".*[11]

Of course, one may argue that the case described was at high risk, having been on a flight from the USA a short time before presentation and significant myocardial injury the day after presenting in HHS. Furthermore, the case presented was not of HHS but of a mixed picture – the mild acidosis (pH 7.2, ketones 3.3 mmol/L) suggesting a mixed picture of HHS and DKA – a situation associated with higher 30-day mortality than HHS or DKA alone.[12]

These and other data highlighted by Sim *et al* show that there is not currently enough evidence to recommend treatment dose prophylaxis in everyone presenting with HHS. The small number of case reports and case series are heterogeneous in nature and the individuals described had a variety of medical and surgical conditions that meant that anticoagulation was not indicated or appropriate. We maintain the view as laid down in the JBDS HHS guidelines that an individual risk assessment for VTE should be performed for all patients presenting with HHS. We cannot support therapeutic dose anticoagulation in all patients presenting with HHS based on the available limited clinical trial data.

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