We suggest that there are two additional learning points from this case.

Firstly, phaeochromocytoma crisis with sustained hypotension is notoriously difficult to manage and there is normally a significant component of myocardial dysfunction due to catecholamine toxicity. An effective treatment (along with aggressive volume replacement) is some form of mechanical circulatory support such as cardiopulmonary bypass or veno-arterial extracorporeal membrane oxygenation.[3,4] The use of this type of circulatory support is strongly associated with improved survival in hypotensive phaeochromocytoma crisis.[2] If required, urgent surgery can be performed whilst on mechanical support.[5]

Secondly, the authors correctly point out that intravenous alpha blockade (phentolamine and phenoxybenzamine) is currently difficult to access in UK. In preference to using no alpha blocking agents, clinicians who find themselves in these circumstances should consider using intravenous magnesium for medical stabilisation.[2,6] There is an evidence base for intravenous magnesium[7,8] as an alternative to alpha blockade and importantly the drug is familiar to many intensivists due to its critical role in eclampsia treatment. ■

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Response

We thank O'Toole, Brown and Drake for their informative response to our article.[1] We agree that it is important to highlight alternative parenteral regimens to alpha-blockers. In addition, volume expansion and careful management of fluid status is central to successful management as in our case. We also thank Whitelaw, Prague and Mustafa for their insights into the use of mechanical circulatory support as rescue therapy. We acknowledge the association with myocardial dysfunction associated with catecholamine toxicity. In collaboration with colleagues in Oxford and London, we previously reported on the high prevalence of cardiac involvement in newly diagnosed phaeochromocytomas along with persistence of some parameters on cardiac magnetic resonance following successful surgery. We would advocate for the use of multi-centre registries for such rare conditions to improve treatment outcomes. ■

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CYP24A1 mutations and hypervitaminosis D

Editor – We read with interest the case report entitled 'Risks of the 'Sunshine pill' – a case of hypervitaminosis D'.[1] We wish to congratulate the authors on reporting this remarkable case, and hoped to make some additional contributions.

While noting that hypervitaminosis D is rare and can occur with excessively high doses of supplementation, they omit from their differential diagnoses the possibility of *CYP24A1* mutations, a well-described alternate cause of the phenotype described in their patient. Loss of function mutations in *CYP24A1* result in reduced action of 1,25-hydroxyvitamin-D_3-24-hydroxylase, which usually inactivates active vitamin D. As well as a neonatal presentation, patients with *CYP24A1* mutations can present with adult-onset hypercalcaemia, together with low parathyroid hormone levels and high urinary calcium.[2,3] If this genetic condition is present, even modest vitamin D supplementation can lead to significant hypercalcaemia. Indeed, high levels of active vitamin D metabolites are found in some *CYP24A1*-deficient individuals even without supplementation.[3]

We acknowledge that in the case described by Ellis *et al* supplemental doses were truly high,[1] but the possibility of vitamin D unmasking *CYP24A1* mutations should have been considered. The identification of patients with *CYP24A1* mutations is

important as it allows for tailored lifestyle advice for the patient, screening of at risk family members and opens up the possibility of specific treatments targeting vitamin D production.[4]

In cases of hypercalcaemia, a renal tract ultrasound, looking for nephrocalcinosis, suggestive of a more longstanding kidney disorder, should be performed. Finally we would always advocate taking a detailed family history in such cases, irrespective of the patient's age, to identify any familial pattern of renal stones, nephrocalcinosis or hypercalcaemia ■

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Age adjusted D-dimers

Editor – I enjoyed the article by Dutton *et al*[1] who described the process of retrospectively creating an age adjusted D-dimer for the assay they used. The use of an age-adjusted cut-off has been successfully tested across a range of D-dimer assays, although a different Hemos assay was used in the study by Mullier *et al.*[2] It made me grateful that our hospital used one of the six assays used in the original ADJUST–PE study[3] which allowed us to rapidly adopt this strategy within our trust.

However, I am surprised that the authors used the three level Wells pre-test probability score. In 2012 NICE recommended using a two level Wells score (CG 144),[4] using the terms 'likely' and 'unlikely' to replace 'high, intermediate and low' risk in the original Wells score. It would be a shame not to highlight the use of the more simple score for clinicians. It was the most cost effective scoring system, and easier to use (less chance of confusion about what to do with the intermediate group) and well validated when compared with a variety of pre-test probablility systems.

If the authors are concerned that their assay was validated alongside the original Wells score (the only published evidence I could find for the HemosILTM D-dimer assay reference range used the two level Wells score with 512 patients)[5] then the work they have done with 329 patients will allow them to compare the two and three level Wells scores at the same time. ■

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