

## Vitamin D supplementation for women before and during pregnancy:

an update of the guidelines, evidence, and role of GPs and practice nurses

### INTRODUCTION

UK National Institute for Health and Care Excellence (NICE) guidance (2014) advises that 10 µg vitamin D should be taken by all women throughout pregnancy, ideally starting prior to conception.<sup>1,2</sup> However, the terminology used and practicalities of implementing this advice can be confusing, as can the role of the GP and practice nurse regarding the provision of supplementation; — particularly as their involvement in routine antenatal care is tending to diminish. This article summarises the evidence and related guidance on managing vitamin D status in pregnant women, and provides an update on the ways in which women can obtain the necessary supplements.

### BACKGROUND

Vitamin D is not only integral to calcium homeostasis and bone health, but it also has multiple other sites of action throughout the body, including the pancreas, skin, intestine, and immune system. In the UK, dietary sources of vitamin D are limited and account for only 10–20% of the total body store; natural sources include oily fish, egg yolk, and red meat, while fortified foods include infant and toddler formula milks, some breakfast cereals, and margarines. The majority of vitamin D is from skin synthesis following exposure to sunlight, although in the UK the necessary wavelength of ultraviolet radiation is only available between April and mid-October.<sup>1,3</sup>

Most laboratories measure serum 25-hydroxyvitamin D (25[OH]D) as a reflection of current vitamin D stores, which equates to the levels produced cutaneously and through diet. Serum levels of 50 nmol/L or higher of 25-hydroxyvitamin D are considered sufficient to maintain adequate bone health in the general population.<sup>1</sup> Severe vitamin D deficiency is a serum level of <25 nmol/L 25(OH)D, and results from the National Diet and Nutrition Survey suggest that around one-fifth of adults in the UK are severely deficient.<sup>4</sup> Risk

factors particularly relevant to pregnant women include having darker skin and wearing clothing that covers most of the skin.<sup>2</sup> Among antenatal populations rates of vitamin D deficiency are estimated to range between 13–64%, depending on ethnicity.<sup>5</sup>

The Scientific Advisory Committee on Nutrition<sup>1</sup> published a report in 2016 examining the most recent evidence regarding vitamin D and health. They concluded that maternal serum 25(OH)D concentration correlates with that of the neonate, and reflects the provision of a 'store' of vitamin D to supplement the exclusively breast-fed infant, given that breast milk is not a significant source. Therefore mothers with low levels of vitamin D are more likely to have babies who are also deficient. The consequences of this are less clear. Maternal vitamin D supplementation was found to reduce neonatal hypocalcaemia. However, research findings examining the associations between maternal vitamin D levels and other conditions hypothesised to correlate, such as gestational diabetes, pre-eclampsia, low birth weight, and cognitive developmental issues, are inconsistent, with most studies having significant methodological limitations and small sample sizes.

### CURRENT GUIDELINES

In light of what is known about the high levels of vitamin D deficiency in pregnant women, and the fact that maternal vitamin D stores reflect those of the neonate, the Department of Health recommends that all pregnant women take a supplement containing 10 µg vitamin D *throughout pregnancy*.<sup>6</sup> Although the effects of vitamin D deficiency and supplementation during pregnancy is an area that still requires further research, supplements are considered very safe and the recommended daily intake is well below levels that have potential to harm.<sup>1,4</sup>

There is no evidence to support routine screening for vitamin D deficiency in

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### Box 1. Eligibility for the UK 'Healthy Start' scheme

At least 10 weeks pregnant or have a child aged <4 years and they or their partner claim:

- Income Support; or
- income-based Jobseeker's Allowance; or
- income-related Employment and Support Allowance; or
- Child Tax Credit (*with a family income of £16 190 or less per year*); or
- Universal Credit (*with a family take home pay of £408 or less per month*).

Additionally: all pregnant women and girls aged <18 years, irrespective of benefit claims.

pregnant women, even in high-risk groups. Testing for serum vitamin D costs around £20, so universal supplementation is considered more cost-effective.<sup>2</sup> Measuring vitamin D levels during pregnancy should only be done if appropriate as part of routine clinical management; in the antenatal population this will primarily be patients with hypocalcaemia or symptoms potentially attributable to severe deficiency (generalised musculoskeletal pain, proximal muscle weakness, hyperalgesia, a waddling gait). Some of the milder symptoms may occur frequently in pregnant women, but it is worth considering vitamin D deficiency as a common, treatable cause of low-level antenatal morbidity. Those with confirmed vitamin D deficiency will require replacement rather than standard supplementation, which is beyond the scope of this article.<sup>3</sup>

#### THE ROLE OF THE GP AND PRACTICE NURSE

All women should receive advice at their booking visit about the importance of vitamin D supplementation throughout pregnancy, but the Department of Health also specifies that healthcare professionals have a responsibility to '... take particular care to check that women at greatest risk of deficiency are following the advice during pregnancy...'<sup>6</sup>

Free antenatal vitamins containing the recommended dose of vitamin D are available through the UK 'Healthy Start' scheme, to eligible women from their 10th week of pregnancy (Box 1). This scheme provides coupons to exchange for vitamins (as well as vouchers for free fruit, vegetables, cow's milk, and infant formula). Women need to fill in a form, which can be obtained from midwives

and health visitors, by calling the helpline, or printing it off online, and it must be signed by a healthcare professional. Women then receive coupons in the post to exchange for vitamins at distributing organisations, such as Children's Centres, although local availability varies.<sup>7</sup> Limited evidence on the uptake of 'Healthy Start' supplements suggests it is lower than 10% of those entitled;<sup>2</sup> reasons cited include lack of awareness of the scheme among both healthcare practitioners and eligible women, difficulty of access, and a complex distribution system. Furthermore, women can only claim the coupons from 10 weeks' gestation, contrary to guidance, which recommends vitamin D supplementation throughout pregnancy. Women who do not qualify for the 'Healthy Start' scheme can purchase vitamin D supplements over the counter. The national position regarding the prescription of vitamin D for those ineligible for 'Healthy Start' is ambiguous; it is not explicitly recommended and yet NICE guidelines advise that at-risk groups should receive free supplements.<sup>2</sup>

#### CONCLUSION

Maternal vitamin D deficiency is common and can result in low vitamin D levels in the newborn. Universal vitamin D supplementation of 10 µg/day is recommended to all pregnant women and preferably periconceptually, regardless of risk factors. Testing of vitamin D levels should be reserved for women with symptoms suggestive of deficiency. GPs and practice nurses should encourage women to take vitamin D supplementation throughout pregnancy and signpost eligible women to the Healthy Start scheme. Ineligible women can purchase vitamin D supplements over the counter but there is a need for clarity in the national position of whether or not they can also receive them on prescription.

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