



## **Elevated HCG in a 53-Year-Old Post-Menopausal Women Referred from Antenatal Clinic**

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### **Introduction**

In the United Kingdom the number of women giving birth after their forty-fifth birthday has increased nearly fivefold since 1988 [1] despite the overall birth rate steadily declining [2]. This trend means that women over fifty are becoming more likely to try and conceive.

Human chorionic gonadotropin (HCG) is a hormone produced by syncytiotrophoblastic cells of the placenta. Around 20% of HCG is excreted in the urine [3]. This urinary excretion provides the standard for identifying pregnancy at home, with increasingly high sensitivity which can detect HCG levels as low as 10 mIU/ml [4 5].

Though in smaller amounts HCG has various other sources including the liver, colon and pituitary gland, with pituitary excretion increasing following menopause [6]. Given the significant rise in women who may be perimenopausal trying to conceive and the associated rise in pituitary HCG production in this population, false positive pregnancy tests and referral to maternity services in this cohort may become more prevalent.

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## Case Presentation

A 53-year-old para 2 patient was referred to the early pregnancy clinic following her antenatal booking scan. She was with a new partner and had been hoping for another baby. A transvaginal (TV) ultrasound scan (USS) revealed no sign of viable intrauterine pregnancy and the patient was referred to the early pregnancy unit with pregnancy of unknown location. Her last menstrual period (LMP) was in 2015 when she was diagnosed with breast cancer and given Tamoxifen for 5 years following radiotherapy. The BMI was 28.6, and she was otherwise fit and well, apart from depression for which she took Venlafaxine.

Serial serum HCG measurements twenty-four days apart were 13 and 14 IU/L respectively. And a follow up TV/USS again showed no signs of intrauterine pregnancy, thin endometrium and small ovaries with no cysts. During this month-long period the patient reported multiple positive urinary pregnancy tests (UPT) with high sensitivity kits 7, these results differed to the negative result using less sensitive hospital kits.

The previous year she had a positive pregnancy test and her HCG was 6.2. Her TV/USS at that time also showed a thin endometrium with no ovarian cysts.

For completeness and to help the patient understand her current fertility, serum oestradiol, progesterone, luteinizing hormone (LH) and follicular stimulating hormone (FSH) were also ordered. The results were <55pmol/L, <1nmol/L, 79.8IU/L and 94.6IU/L respectively, confirming menopause. This was discussed with the patient who was then discharged once we had explained to her that these HCG levels are normal in her post-menopausal which were arising from the pituitary.

## Discussion

Other than pregnancy, it is important for physicians to have an understanding of other causes of an elevated hCG. Potential causes include malignancy such as gestational trophoblastic disease, false-positives from varying assays and pituitary production of HCG [8].

In post-menopausal women, hCG is produced alongside structurally similar LH and FSH from the anterior pituitary [9]. With the decrease in estrogen and progesterone during menopause, the negative feedback of the hypothalamic-pituitary-ovary axis is lost, leading to elevated gonadotropins and concurrent elevation of hCG. 10 An HCG of up to 14 in the menopausal women can be a normal variant [10, 11 12,13]. Thus, highly sensitive pregnancy tests are able to detect these low levels of HCG which leads to false positives [14].

The lack of understanding about the reasons behind elevated HCG in perimenopausal and menopausal women has several implications. Additional investigations including repeated blood tests and scans are unnecessarily requested to rule out malignancy [15]. Delays in receiving treatment or wrongful initiation of toxic treatment have been initiated as a result [16]. Importantly, patients have to endure the lengthy testing period and frequent medical consultations which amounts to significant psychological and mental distress [17].

This is particularly useful knowledge for primary care physicians who are often the first source of referral to tertiary care. Knowing this information enables the physician to appropriately manage their patients' expectations and only refer when necessary. Currently guidance in the UK does not stipulate any variation in the initial antenatal presentation and management of women with a positive UPT who are over fifty [18].

## **Conclusion**

We have presented a case of a 53-year-old woman who presented for her booking scan following multiple positive urinary pregnancy tests. With further investigation revealing this to be a false positive following menopause. More widespread knowledge of this phenomenon in perimenopausal and menopausal women trying to get pregnant can help guide antenatal care and appropriately manage expectations. Current guidance does not suggest further testing for this group other than a HCG UPT prior to their first appointment. Given the clear rise in this demographic attempting conception this approach may warrant review

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