

Ménière's disease in women – can the cyclical nature of symptoms in some women provide insights into its mechanism of action?

Suzanne Monaghan

The internet abounds with anecdotal stories from women of how their symptoms appear to worsen at points in their menstrual cycles, or during pregnancy. In fact, the worsening of symptoms during pregnancy is often what leads to a diagnosis for many women. Despite this, little is said on the matter on official sites, leaving women surprised and unprepared for attacks, or unaware that their severe premenstrual symptoms may actually be indicative of Ménière's. Here I take a look at the evidence for the claims which, if true, mean doctors and patients need to take gender into account when developing treatment strategies.

A small 2013 study focusing on women with Ménière's showed that the number of vertigo episodes in premenopausal women was almost double that of postmenopausal, and additionally that 62.5% of the postmenopausal women reported having noticed an improvement in their symptoms after the menopause. Of the still menstruating women, 70% claimed to have noticed a worsening of their symptoms during the premenstrual period [1].

Another study found a significant decrease in vertigo during the premenstrual period in women who also matched the criteria for Premenstrual Syndrome [2] – a condition characterised by bloating, emotional changes and fluid redistribution. As a low salt diet is strongly recommended for Ménière's sufferers, with the goal of reducing endolymph pressure in the inner ear, it is plausible that hormones which increase fluid retention may have the opposite effect.

But as vertigo is a known symptom of PMS, how can we be sure this is an actual increase in Ménière's symptoms? Well, in addition to worsening vertigo, it has been shown that there are measurable differences in audiometric function [3], with hearing significantly worse during the premenstrual period in susceptible Ménière's patients. This suggests the problem is not limited to just an increase in vertigo, but of other Ménière's symptoms as well.

It has also been shown that treatment with leuprolide acetate, which abolishes gonadotropin-dependent ovarian sex steroid production, led to the cessation both of menstruation and of Ménière's symptoms in women with cyclic Meniere's symptoms[4], again strongly indicating a link between hormone changes in women and attacks.

So what are the factors which may be driving this effect?

Increased oestrogen and progesterone

Both these hormones can cause sodium and water reabsorption and lead to increased plasma volume. [5]

Thyroid hormones

Hypothyroidism has been posited as a cause of premenstrual syndrome [6] and known to be comorbid with Ménière's in many patients [7].

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Stress

Stress, increased levels of antidiuretic hormone and onset of Ménière's attacks in both sexes were linked as early as 1952[8], with a study linking symptom severity to stressful life events, and this would explain why they could be more severe for women suffering from PMS, who are generally more emotional and stressed at that time of the month. This theory was revived and expanded in 1997[9] showing there was a link between stress, increased levels of anti-diuretic hormones and vertigo.

Antidiurectic hormone

ADH levels were found to be significantly higher in Ménière's patients undergoing an acute attack than when they were in the remission phase. The researchers also note high stress levels in patients during attacks, although no correlation between stress scores and ADH levels in their study group. They also suggest that it may be in fact a vasopressin (an antidiuretic hormone) sensitivity and the high levels of ADH may be symptomatic, rather than causative. Another study showed a greater concentration of vasopressin-2 receptor sites in the Meniere's group, and it may be that this greater sensitivity to vasopressin is more important than ADH levels [10].

Migraines

Migrainous vertigo does not always causes headaches and shares a lot of similarities with Ménière's, including vertigo, hearing loss and tinnitus, and it is known to be triggered by menstruation. It may, therefore, be that the apparent increase in symptoms around this time is actually a misdiagnosed migraine.

Blood viscosity

For unknown reasons, blood viscosity peaks in women just before menstruation, before rapidly normalising [11]. This may be relevant to Ménière's sufferers as increased blood viscosity has been shown to result in inner ear dysfunction, leading to hearing loss, tinnitus and vertigo [12].

Pregnancy

There are conflicting reports from pregnant women with Ménière's, some say their symptoms were at their worst during pregnancy, others say they had no symptoms at all. These problems are not unique to sufferers though, with one study showing of 82 pregnant women interviewed 33% reported tinnitus, 24% pressure in the ear, 18% hearing reduction over the course of their pregnancy and over 22% reporting vertigo in the first trimester [13]. This indicates the fluctuating hormone levels cause problems even in healthy women, although not to the debilitating extent women with Ménière's report. The most likely cause is down to the increased fluid retention in pregnancy, leading to reduced serum osmolality.

In one case study following a patient through her pregnancy, vertigo attacks increased up to 10 times per month during early pregnancy, when the serum osmolality was significantly below normal, decreasing in frequency over the course of the pregnancy as serum osmolality rose to normal levels [14]. The osmolality is a measure of the amount of dissolved sodium, potassium, urea and glucose in the blood, and it is theorised that low levels of these solvents induce an osmotic gradient between the outer and inner endolymphatic sac in the ear, causing water to enter into the endolymphatic space and trigger the symptoms of Ménière's.

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They also noted an increase in symptoms after birth, which was not linked to osmolality, but may have been stress-related.

Conversely, some women with Ménière's report an improvement of their symptoms during pregnancy. This may be down to a prostaglandin called PGI₂, which is increased during pregnancy, and has been shown to cause significant long term reduction in vertigo, completely controlling it in 65.9% and improving it in 29.5% of 44 patients [15].

So, in summary, it seems advisable for women with Ménière's to prepare for the possibility of their symptoms worsening greatly premenstrually and during early pregnancy, and for doctors to consider the possibility that any patients they see with severe vertigo brought on by menstruation or pregnancy may in fact be suffering from undiagnosed Ménière's. It may be advisable to preempt the increased severity of symptoms by prescribing an antidiuretic to susceptible women before their period in addition to a low-salt diet.

However, not all women with Ménière's have symptoms that fluctuate with their cycles; the fact that some do provide clues into the mechanism of this poorly understood disease and, hopefully, if it is confirmed why this happens in some women, we can use that information to provide new treatments to all sufferers, male as well as female.

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