How hormones affect our moods

October 6 2015, by Jayashri Kulkarni

Some women are very sensitive to small shifts in hormones, others aren't. Credit: Petras Gagilas/flickr, CC BY

"It's that time of the month – stay away from her!"

The process of shedding the uterine lining with vaginal bleeding every month has an obvious reproductive focus, but it has also long been

linked with changes to mood and behaviour. Unfortunately, this has often been an attempt to consign women to a "biologically" determined place of inferior mental functioning.

In recent times, we have learnt more about the connections between the "reproductive" or gonadal hormones and the brain, and how they affect not only women but men as well.

Gonadal hormones (oestrogen, progesterone and testosterone) are produced by the gonads (the ovaries and testes) in response to other precursor hormones found in the pituitary gland and other brain areas. These gonadal hormones impact brain chemistry and circuitry, and hence influence emotions, mood and behaviour.

Women's hormones

Oestrogen appears to be a "protective" agent in the brain. This may in part explain why some women feel worse, in terms of their mental state, in the low-oestrogen phase of their monthly cycle.

Oestrogen appears to have direct impacts on dopamine and serotonin, the key brain chemicals associated with the development of depression and psychosis. In fact, animal and clinical studies show that administering oestradiol (the most potent form of oestrogen) can improve symptoms of psychosis and depression.

The concept of PMS (premenstrual syndrome) has its believers and non-believers. But essentially, there is a group of women who experience significant mental and physical symptoms in the low-oestrogen phase of their cycle every month.

Credit: AI-generated image (disclaimer)

Then there are women with crushing depression once per month that is known as premenstrual dysphoric disorder (PMDD). PMDD is a serious, real depression that can rob a woman of her functioning every month. The tricky part is that it's not always exactly the week before bleeding, nor does it last exactly a week since many women do not have the "classic" 28-day cycle with ovulation at day 14, and bleeding for five days. If life were that simple!

The impact of gonadal hormones on mood is apparent at many other life stages. Around puberty, a time of major hormonal change, many girls experience various mood swings and other changes in mental health. Some women who take certain types of the combined oral contraceptive experience depressive symptoms with irritability, loss of enjoyment and even suicidal thoughts.

Postnatal depression and psychosis are key mental illnesses related to childbirth and have a major hormonal component to the onset and course of illness. This is thought to be triggered by the sudden, rapid drop in the high levels of pregnancy hormones shortly after birth.

During the transition to menopause, women experience major hormonal shifts. At this time, they are 14 times more likely than usual to experience depression. This is known as perimenopausal depression. It affects women differently than other types of depression, causing anger, irritability, poor concentration, memory difficulties, low self-esteem, poor sleep and weight gain.

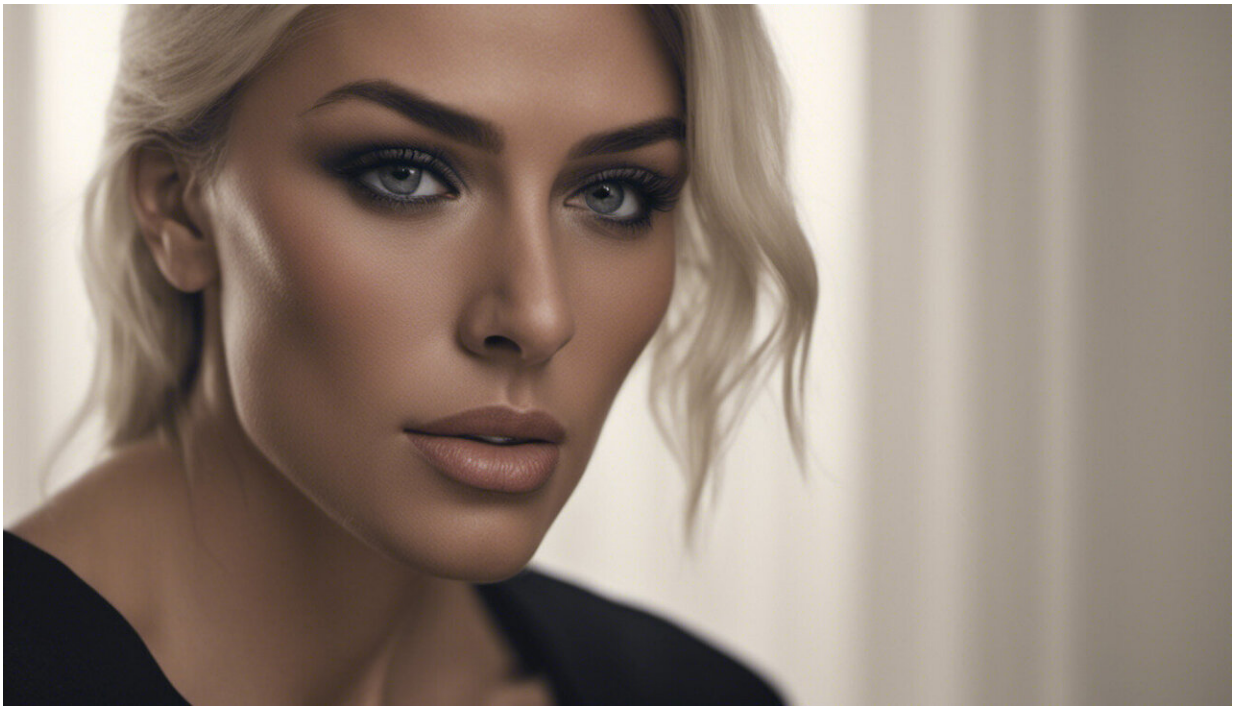
Perimenopausal depression isn't well recognised and is often poorly treated with standard antidepressant therapies. Women with this type of depression generally respond better to hormone treatments, but the link between depression and hormones is not often made.

It's also important to note that trauma and violence can lead to chronically elevated levels of the stress hormone cortisol, causing significant mental ill health at any time in a woman's life. High cortisol levels have huge impacts on many brain regions, resulting in rage, suicidal thoughts, obesity and infertility.

There is a great deal of variation in the effects of hormone shifts on mood and behaviour. Some women are very sensitive to small shifts in gonadal hormones; others are not.

Men's hormones

Recent research investigating cognition in men suggests that, just like in women, gonadal hormones influence mood and behaviour. In particular, low levels of testosterone can lead to an age-related condition called andropause.



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Andropause is sometimes described as the "male menopause". This is not strictly accurate since unlike female fertility, male fertility does not end abruptly with a fixed hormone decline. Andropause is caused by a significant decline in testosterone levels to below the normal range for young men. This can result in erectile problems, diminished libido, decreased muscle strength and decreased bone mass.

To complicate matters, testosterone is converted to oestradiol (the most potent form of oestrogen) in men. Altered testosterone/oestradiol ratios can cause problems with memory function, depression, irritability, sleep, fatigue and occasionally even hot flushes.

There is controversy about how much of these changes are a normal part

of ageing. Many other factors such as obesity, diabetes and excessive alcohol consumption can also cause low testosterone levels. So andropause should not be viewed as a disease, but as a clinical syndrome with a great deal of variability.

In some men, testosterone-replacement has been used successfully to treat andropause. But this needs to be done under strict medical supervision because of the many potential side effects including prostate problems, elevated cholesterol and increased rage.

Credit: AI-generated image (disclaimer)

A great deal more research is required in both men and women on the role of gonadal hormones and mental health. But the era of splitting the mind from the body should be long gone.

Source: The Conversation