

Is estrogen going to your head?

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Girls are growing up faster than ever – and not only when it comes to their taste in fashion and music. Their bodies are reaching puberty at an increasingly earlier age, and this trend to rapid maturity continues through women's adult lives. That's bad news, according to Tel Aviv University researchers. Women today are more likely to develop Hyperostosis Frontalis Interna (HFI), a hormonal condition once typically found in post-menopausal women, earlier and more frequently than the female population a century ago.

Women's hormonal balances are changing and taking a physical toll, says Prof. Israel HersHKovitz and his graduate student Hila May of TAU's Sackler Faculty of Medicine, together with Dr. Natan Peled of Carmel Medical Center in Haifa. That balance is being affected by the hormones we now consume in our food and by our changing fertility patterns, such as having children later in life. Women today are 2.5 times more likely to develop HFI than they were 100 years ago, the study found.

Their research recently appeared in the [American Journal of Human Biology](#).

Sounding the alarm

HFI occurs when a hormonal imbalance leads to the growth of lesions, or bone masses, in the inner skull. This may lead to symptoms such as chronic headaches, weight gain, and thyroid irregularities, and is suspected to have multiple causes, including lifestyle, fertility habits, nutrition, and environment.

To track the growing prevalence of HFI, Prof. HersHKovitz and fellow researchers compared 992 historic female skulls from museum collections aged 20 to 90 years with CT scans of 568 living female participants ranging from 20 to 103 years old. Not only was prevalence of HFI found to be 2.5 times higher in the latter group, but the researchers also discovered that the average age of women who suffered from HFI had fallen drastically.

An age-dependent condition, HFI was once known to primarily strike post-menopausal women, who had then been exposed moderate levels of [estrogen](#) throughout their lives. Now it is appearing as well in pre-menopausal women, who have been exposed to higher levels of estrogen earlier in their lifetimes.

Their survey found that only 11 percent of 19-20th century women in the age range 30-39 had HFI. However, in the modern sample, 40 percent of women in that age group were found to be developing the condition. Any number of factors could be to blame, May says. Hormones added to food are one culprit, but not the only one. Women are now having fewer children and getting pregnant later in life. The period of time women breastfeed has also been shortened considerably, from three to four years a century ago to an average of less than six months today. Women are also consuming additional amounts of hormones through birth control medications. It's now common for girls to be on "the pill" in their early teenage years.

There is currently no cure for HFI, but detection of the condition remains important, says Prof. HersHKovitz, who was among the first scientists to investigate the development of HFI in the human skull. "It's an alarm within the human body, telling you that your body is out of balance and there is a pathological process going on," he explains. It can also be a symptom of metabolic diseases.

Not just for women

Although most frequently found in the female population, HFI is not an exclusively female condition. Prof. HersHKovitz points to the case of Farinelli, a famous male opera singer in the 18th century, who suffered from HFI probably as a result of castration to preserve his falsetto voice.

Prof. HersHKovitz, Dr. Peled and May discovered a high prevalence of HFI in men who have been treated for prostate cancer. One of the treatments for prostate cancer, explains Prof. HersHKovitz, is chemical castration. Since the cancer itself feeds on testosterone, this treatment option literally starves the disease, but leads to higher levels of estrogen in the body.

Prof. HersHKovitz does not counsel against the prostate treatment, however — it is part of the physiological "cost-benefit" balance of the body. "If you treat one system in the body, another must pay," he says. In this case, he says, it's worth the price.

Provided by Tel Aviv University

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