Children are growing horns from using cellphones

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STORY AT-A-GLANCE

- Extensive use of screen-based activities and the associated poor posture may be triggering the growth of bony projections on children's skulls
- Enthesophytes are bony projections that form at an attachment site of ligament, tendon or joint capsule to a bone
- These bony protrusions may take on a spike, hook or horn-like appearance on X-rays, but have historically primarily been seen in the elderly, as the growths are thought to develop slowly over time
- A type of enthesophyte called enlarged external occipital protuberances (EEOP) was found in 41% of 18- to 30-year-olds in one study
- In another study published in 2018, researchers found that a combination of gender, the degree of forward head protraction and age was predictive of EEOP; being a male and increased forward head protraction were most linked to prominent bone growths
- One of the study's authors is a chiropractor who specializes in treating the "forward head posture epidemic" and has offered posture pillows for sale on his website, leading some to question the findings' validity

The perils of too much screen time and cellphone use for children and adolescents run the gamut from triggering feelings of envy and depression[1] to interfering with sleep and academic performance[2] and even possibly increasing the risk of cancer.[3]

But one of the most shocking revelations potentially linked to cellphone use was quietly published in the Journal of Anatomy in 2016.[4] It relates to enthesophytes, which are bony

projections that form at an attachment site of ligament, tendon or joint capsule to a bone.

These bony protrusions may take on a spike, hook or horn-like appearance on X-rays, but have historically primarily been seen in the elderly, as the growths are thought to develop slowly over time,[5] as the result of mechanical stress and strain — the type that results from overuse and repetitive movements performed over decades.

The study, however, found such growths — in particular a type of enthesophyte called enlarged external occipital protuberances (EEOP) — not on hunched-over elderly people, as one might expect, but rather on young adults, with researchers suggesting screen-based activities may be to blame.

41% of young adults found to have bony growths on their skulls

Researchers reviewed 218 X-rays of 18- to 30-year-old study participants with no symptoms and compared them to X-rays of age-matched mildly symptomatic participants. According to the study:[6]

> *"In recent years, the presence of an enlarged external occipital protuberance (EEOP) has been observed frequently in radiographs of relatively young patients at the clinic of the lead author.*
>
> *To the best of the authors' knowledge, reports concerning enthesophytes projecting out of the EOP are rare in the medical literature, although a few reports do exist in the anthropological and forensic science literature.*
>
> *Accordingly, the aim of this study was to: (i) quantify the prevalence of EEOP within apparently healthy, asymptomatic, young adult participants; and (ii) compare these data with a cohort of mildly symptomatic age-matched individuals."*

An EOP was defined as a growth measuring at least 5 millimeters (mm), while an EEOP was considered 10 mm or more in size. EEOP was found in 41% of the population, with 10% having an EEOP measuring 20 mm or more.

The growths were significantly more common in males (67.4%) compared to females (20.3%), as well as tended to be larger in males. In fact, the longest EEOP measured in a male was 35.7 mm, compared to 25.5 in the female group.

"The high percentage (41%) of EEOP presentation in the test population was surprising," the researchers noted. "The prevalence of an EEOP in the young age group may suggest that excessive forces are acting on the EOP at a younger age."[7]

Is screen time causing horns to grow?

Enthesophytes can have many causes, which may be biomechanical, immunological or genetic in nature.[8] In the featured study, however, the researchers stated that the young age of the population suggests that if the EEOPs are due to pathophysiological processes, the percentage of individuals affected should be considerably less than what was found.

"Secondly," they noted, "if the presence of EEOP is due to aging and mechanical factors, the EEOP should appear at a more advanced age than that of the sample population. Accordingly, it would appear that additional factors must be considered as the predominant drivers for this phenomenon."[9]

Such "additional factors" include extensive use of screen-based activities and the associated poor posture. Although the 2016 study did not look into this directly, they concluded:[10]

> *" ... [T]he absence of postural and ergonomic data restricts definitive conclusions on the causes of EEOP in the test population. However, the age of the population and high incidence of EEOP suggests that it is unlikely that the current observations are a result of aging-, genetic- or disease-related processes."*

In another study published in 2018, the researchers found that a combination of gender, the degree of forward head protraction and age was predictive of EEOP. Being a male and

increased forward head protraction were most linked to prominent bone growths, whereas, paradoxically, age was linked to a decrease in growth size. They concluded:[11]

> *"We hypothesize EEOP may be linked to sustained aberrant postures associated with the emergence and extensive use of hand-held contemporary technologies, such as smartphones and tablets.*
>
> *Our findings raise a concern about the future musculoskeletal health of the young adult population and reinforce the need for prevention intervention through posture improvement education."*

Study author sells posture pillows

It's always important to look at the source when considering scientific research, and these studies are no different. One of the study's authors, David Shahar, is a chiropractor who specializes in treating the "forward head posture epidemic,"[12] and has offered posture pillows for sale on his website.

This doesn't necessarily mean the study data aren't valid, but it's a potential conflict that should have been disclosed in the peer-reviewed Scientific Reports where one of the studies were published — but it wasn't.

Shahar told Quartz of the potential conflict, "I have been largely inactive in that front over the years of my research, and this research does not discuss any particularly related intervention methods,"[13] although Quartz pointed to one statement that reads "the mitigation of poor postural habit through prevention intervention may be prudent."[14]

Another potential issue is that the 1,200 participants used for the 2018 study came from a "clinician's database," which reportedly is Shahar's database. As Quartz reported:[15]

> *"If you really wanted to get a look at the effects of smartphone use on neck health, you'd want data from the general population, not people who were already concerned about neck or back pain.*

> *The paper acknowledges that issue, and excludes any patients who reported severe neck pain. But it doesn't state that the patients came from Shahar's personal practice, who may have skewed the data because they explicitly sought help with their posture."*

That being said, it's certainly plausible that too much screen time could be leading to unexpected consequences due to the mechanical distortions is causes to your body. Such problems have been revealed before.

Problems with craning your neck over screens

Adults spend about 11 hours interacting with media daily, which includes six hours per day watching videos, 45 minutes on social media and three hours and 48 minutes on digital media (cellphones, computers and tablets).[16] Much of this time, your head may be held in such a way that puts an unnatural strain on your neck and upper body.

"Shahar thinks the spikes form because the hunched posture creates extra pressure on the place where the neck muscles attach to the skull — and the body responds by laying down fresh layers of bone," BBC News reported. "These help the skull to cope with the extra stress, by spreading the weight over a wider area."[17]

The "horns" themselves aren't dangerous, but instead are a "portent of something nasty going on elsewhere, a sign that the head and neck are not in the proper configuration," study co-author Mark Sayers, an associate professor of biomechanics at Australia's University of the Sunshine Coast, told The Washington Post.[18]

In a study of 207 children and adolescents with nonspecific neck pain, all of the participants had strong flexion, or bending, of the neck when using cellphones. The researchers noted:[19]

> *""Text neck," a 21st-century syndrome, is a term derived from the onset of cervical spinal degeneration resulting from the repeated stress of frequent forward head flexion while looking down at the screens of mobile devices and "texting" for long periods of time.*

> *Text neck is becoming more common as more people, especially teens and adolescents, hunch over smartphones. It is estimated that 75% of the world's population spends hours daily hunched over their handheld devices with their heads flexed forward.*
>
> *In our sample, children and adolescents spent averages of 5 and 7 hours a day, respectively, with their heads tilted over reading and texting on their smartphones and handheld devices. Cumulatively, this is an average of 1825 and 2555 hours a year, respectively, of excess stresses seen in the cervical spine area."*

The average adult head weighs 4.54 kilograms (10 pounds) to 5.44 kilograms (12 pounds). When you flex your head forward, the increased forces on your neck lead to changes in your cervical spine and supporting ligaments, tendons and musculature, while also leading to changes in the bony segments. This, in turn, can cause changes to posture and lead to related neck pain.[20]

Cellphone cancer risk confirmed

Aside from the postural risks, radiation from cellphones may cause tumors in rats. The findings stem from government-funded studies conducted by the National Toxicology Program (NTP), an interagency research program currently under the umbrella of the National Institute of Environmental Health Sciences.[21]

The research involved both mice and rats, which were exposed to cellphone radiation for nine hours a day for two years — close to average life span for these rodents. Most concerning, male rats were more likely to develop tumors in their heart known as malignant schwannomas.

In making their conclusions, NTP uses the labels "clear evidence," "some evidence," "equivocal evidence" and "no evidence." They found "clear evidence" that exposure to cellphone radiation led to heart tumors in the male rates, along with "some evidence" that it caused brain tumors adrenal gland tumors in the rats.[22]

Further, according to the National Institutes of Health, "The NTP studies also looked for a range of non-cancer health effects in rats and mice, including changes in body weight, evidence of tissue damage from RFR-generated heating and genetic damage. Researchers saw lower body weights among newborn rats and their mothers, especially when exposed to high levels of RFR during pregnancy and lactation."[23]

The NTP studies only looked at radio frequency radiation (RFR) like that used in 2G and 3G cellphones. The coming **5G, or "5th Generation," wireless network** may cause even greater risks.

Tips for cutting back on screens and RFR/EMF exposure

Whether or not cellphone use is triggering the growth of horns on children, there are multiple reasons to cut back on your screen time, as doing so not only will help protect your posture but also help reduce your **exposure to electromagnetic fields** (EMF) and potentially cancer-causing RFR (not to mention will help you avoid exposure to disruptive **blue light at night**).

If your kids are using screens excessively, set time limits on their exposure, including television, computers, tablets and cellphones. When they do use screens, pay attention to proper posture and use stands to minimize the forward tilting of the head.

Also be sure to turn off screens at least an hour or two before bedtime. To further **reduce your EMF and RFR exposure**, read through the suggestions below and implement as many of them as possible.

Nighttime remediation
Use Stetzer or Greenwave filters to remove voltage transients from your electricity and use meters to confirm that they are in a safe range.
Use a battery-powered alarm clock, ideally one without any light. I use a talking clock for the visually impaired.[24]

Consider moving your baby's bed into your room instead of using a wireless baby monitor. Alternatively, use a hard-wired monitor.

If you must use Wi-Fi, shut it off when not in use, especially at night when you are sleeping. Ideally, work toward hardwiring your house so you can eliminate Wi-Fi altogether. It's important to realize that if you have a Wi-Fi router, you have a cellphone tower inside your home. Ideally, you'd eliminate your Wi-Fi and simply use a wired Ethernet connection.

If you absolutely must have a router, you can place it inside a shielded bag when not in use. You can find shielded items online, or make your own using Swiss Shield fabric. If you have a notebook without any Ethernet ports, a USB Ethernet adapter will allow you to connect to the internet with a wired connection.

For more extensive shielding, you can consider painting your bedroom walls and ceiling with special shielding paint, which will block RF from outside sources, such as cell towers, smart meters and radio/TV towers. Windows can be covered with metal window screen or film. For your bed, consider a shielding bed canopy.

Daytime strategies to reduce unnecessary EMF exposure

To reduce EMF exposure during the daytime, consider using Stetzer filters to decrease the level of dirty electricity or electromagnetic interference being generated. You can also take these with you to work or when you travel. This may be the single best strategy to reduce the damage from EMF exposure since it appears that most of it is generated by the frequencies that the filters remove.

Connect your desktop computer to the internet via a wired Ethernet connection and be sure to put your desktop in airplane mode. Also avoid wireless keyboards, trackballs, mice, game systems, printers and portable house phones. Opt for the wired versions.

Avoid carrying your cellphone on your body unless in airplane mode and never sleep with it in your bedroom unless it is in airplane mode. Even in airplane mode it can emit signals, which is why I put my phone in a Faraday bag.[25] They are really inexpensive

and only $10 for two of them. I tested them and they are highly effective at blocking radiation.

When using your cellphone, use the speaker phone and hold the phone at least 3 feet away from you. Seek to radically decrease your time on the cellphone. I typically use my cellphone less than 30 minutes a month, and mostly when traveling. Instead, use VoIP software phones that you can use while connected to the internet via a wired connection, or better yet, use a landline telephone.

General household remediation

If you still use a microwave oven, consider replacing it with a steam convection oven, which will heat your food as quickly and far more safely.

Avoid using "smart" appliances and thermostats that depend on wireless signaling. This would include all new "smart" TVs. They are called smart because they emit a Wi-Fi signal and, unlike your computer, you cannot shut the Wi-Fi signal off. Consider using a large computer monitor as your TV instead, as they don't emit Wi-Fi.

Replace CFL bulbs with incandescent bulbs. Ideally remove all fluorescent lights from your house. Not only do they emit unhealthy light, but more importantly, they will actually transfer current to your body just being close to the bulbs.

Dimmer switches are another source of dirty electricity, so consider installing regular on/off switches rather than dimmer switches.

Refuse smart meters as long as you can, or add a shield to an existing smart meter.