

Letters:

RESEARCH: THYROID courtesy A. Tsiang

1) Baby et al, 2017. The Effect of Electromagnetic Radiation due to Mobile Phone Use on Thyroid Function in Medical Students Studying in a Medical College in South India. Indian J Endocrinol Metab. 2017 Nov-Dec;21(6):797-802

“Radiofrequency waves are emitted by cell phones. They are non-ionising and the effect on the thyroid gland is part of their non thermal effects.

Conclusion: In our study there was a significant correlation between total radiation exposure and increasing TSH values among both all respondents.”

Full Text: http://www.ijem.in/temp/IndianJEndocrMetab216797-4818202_012018.pdf

2) Esmekaya et al, 2010. Pulse modulated 900 MHz radiation induces hypothyroidism and apoptosis in thyroid cells: A light, electron microscopy and immunohistochemical study 2 Int. J. Radiat. Biol., Vol. 86, No. 12, December 2010, pp. 1106–1116

Rats were exposed to a 900 MHz pulse-modulated RF (cell phone) radiation at a specific absorption rate (SAR) of 1.35 Watt/kg for 20 min/day for three weeks. [Cell phones sold in the US cannot exceed a SAR rating of 1.6W/kg] *“The results indicated that thyroid hormone secretion was inhibited by the RF radiation. In addition, we also observed formation of apoptotic bodies and increased caspase-3 and caspase-9 activities in thyroid cells of the rats that were exposed to modulated RF fields.*

Conclusion: The overall findings indicated that whole body exposure to pulse-modulated RF radiation that is similar to that emitted by global system for mobile communications (GSM) mobile phones can cause pathological changes in the thyroid gland by altering the gland structure”

Pictures of damage to thyroid cells were also included in the study.

RF-exposed rats had higher follicle diameters in their thyroid glands compared to sham and cage control rats ($p < 0.001$). Similarly, diameters of colloids increased significantly in the RF-exposed group ($p < 0.001$).

Full

Text: http://www.avaate.org/IMG/pdf/Tiroides_Pulse_modulated_900_MHz_radiation_induce_hypothyroidism_and_apoptosis.pdf

3) Sangün Ö, Dündar B, Çömlekçi S, Büyükgebiz A. The Effects of Electromagnetic Field on the Endocrine System in Children and Adolescents. *Pediatr Endocrinol Rev.* 2015 Dec;13(2):531-45.

"Children are exposed to various kinds of non-ionizing radiation in their daily life involuntarily...there are unignorable amount of studies indicating the increased risk of cancer, hematologic effects and cognitive impairment. Although they are less in amount; growing number of studies reveal the impacts on metabolism and endocrine function. Reproductive system and growth look like the most challenging fields. However there are also some concerns on detrimental effects of EMFs on thyroid functions, adrenal hormones, glucose homeostasis and melatonin levels...there is growing evidence to distress us about the threats of EMF on children."

Abstract: <https://www.ncbi.nlm.nih.gov/pubmed/?term=The+Effects+of+Electromagnetic+Field+on+the+Endocrine+System+in+Children+and+Adolescents>

4) Mortavazi et al, 2009. Statistically significant differences in TSH ($p < 0.05$) among 3 groups of university medical students using cell phones - non-users had normal TSH, moderate users had higher than normal TSH, heavy users had even higher than normal TSH levels.

Full text

study: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3243874/pdf/OMJ-D-09-00089.pdf>

A higher than normal TSH level, low mean T4 and normal T3 concentrations in mobile users were observed. It has been established that even a small change in

thyroid hormone levels circulating in the blood are sufficient to alter the brain function of subjects

5) Eskander et al, 2012. Study showing long-term effects of cell phone use/cell tower exposure after 6 years. Statistically significant ($p < 0.01$) Lowered levels of thyroid hormones T3, T4 adrenal gland hormones ACTH and cortisol, lowered progesterone and testosterone levels.

Full text study: http://www.escuelasinwifi.org/sites/default/files/imagenes/13-84_11-18-2013_catherine_kleiber_3_of_5_7520958240.pdf