

Clinical Image

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Healthy disorders by WLAN-exposure

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Abstract

By a diagnostic routine of a “burn-out”-patient, additionally claiming an electrosensitivity, there was tested the activity of the autonomic nervous system by electromyogram (EMG). Analyzing the frequency we found an artificial 10 Hz-component like those of WLAN-emitters as a dominant signal. By the following anamnestic discussion, the patient told about a longtime exposure to an active WLAN-equipment in office. Testing other patients using this communication-technique, there was a great number with the same 10 Hz-artifact in EMG. Additionally, some of these patients point out an artificial ECG. Theses data demonstrate the conflicts with the ICNIRP safety guidelines for this type of electromagnetic exposures.

Keywords: WLAN; EMG; electrosensitivity; safety guidelines (ICNIRP).

Background

WLAN (wireless local area network; resp. WiFi) is used as an important worldwide communication-technique. By this always there is an exposure by 10 Hz-modulated electromagnetic fields. In contrast to the ICNIRP-safety guidelines, whereby no bioeffect is possible by these low-energetic electromagnetic fields, we found artificial signals in the nervous and cardiovascular system by WLAN-exposure.

Method

The relaxed patients were tested in an HF-shielded lab under following experimental setup:

Step 1: control

Step 2: active WLAN-router

Step 3: control after exposure

Each epoch was about 9 min, the electromagnetic immission by WLAN at the head was about 25-30 $\mu\text{W}/\text{m}^2$. EMG was sampled by a special electrode matrix fixed at the lower arm skin, ECG-recording at ICR-4-position. The data were sampled

continuously by a LabView-System with following frequency analysis (FFT). The test person has no information of WLAN “on/off”. It was tested, that there is no interference with the analyzing system during active WLAN.

R Patient (A)

(with clinical diagnosis “burn-out”)

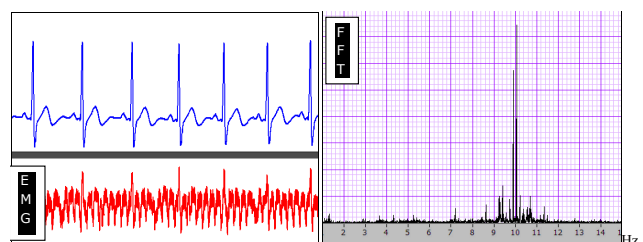


Figure 1a: Control EMG after longtime WLAN-exposure one day before.
left: EMG; time-series (upper curve: ECG for time-compare).
right: EMG; frequency domain by fast-fourier-transformation (FFT).

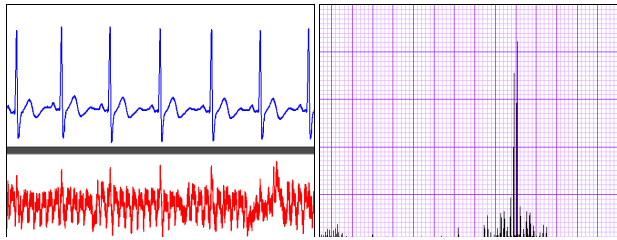


Figure 1b: Same data-processing as in figure 1a; during new WLAN-exposure (record after 2 min).

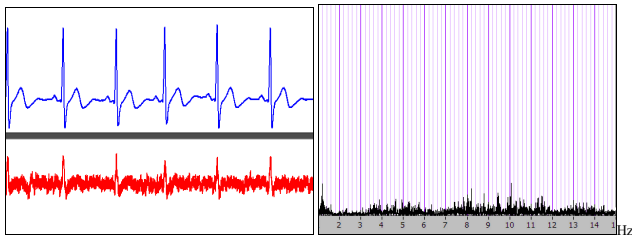


Figure 1c: Same as in figure 1a; 30 s later.

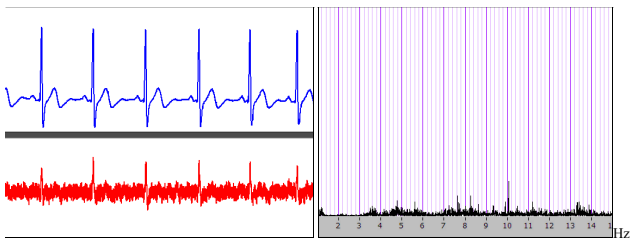


Figure 1d: Control, 6 min after exposure.

About 30 h after WLAN-exposure during office-activity there is a 10 Hz-artifact in EMG-signal (Figure 1a). By a following WLAN-exposure this artifact disappeared after about 3 min. As well during following exposure and subsequent control this 10 Hz-artifact was not to detect. One day later the whole test-program was repeated with the same artifacts in EMG. These data point to a remembrance effect in EMG by exposures in low-frequent-electromagnetic fields.

Patient (B)

(unwellness by longtime “home-office”)

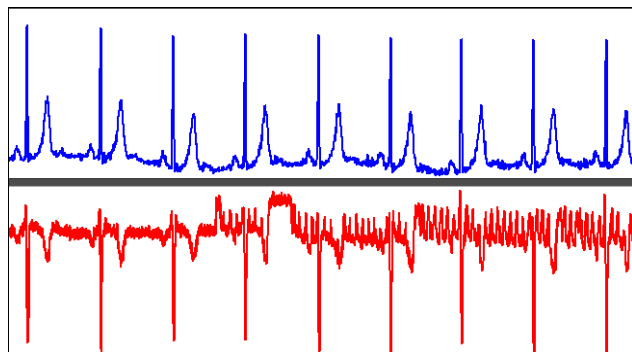


Figure 2a: Control: EMG after WLAN-exposure by “home-office” about 10 h before.

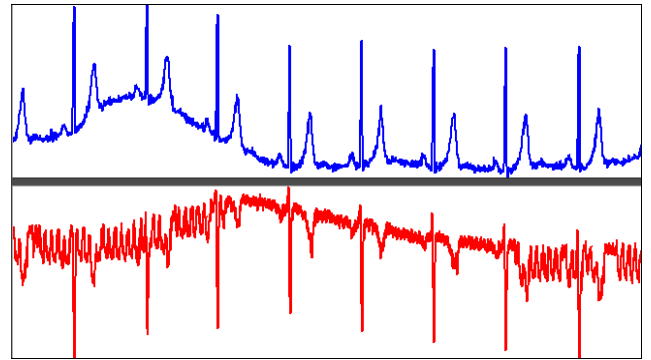


Figure 2b: Same as in Fig. 2a; 2 min later. In this case, there was found several spontaneous 10 Hz-artifacts in EMG after WLAN-exposure one day before.

Patient (C)

(disclaiming “cardiac arrhythmia” during home-office)

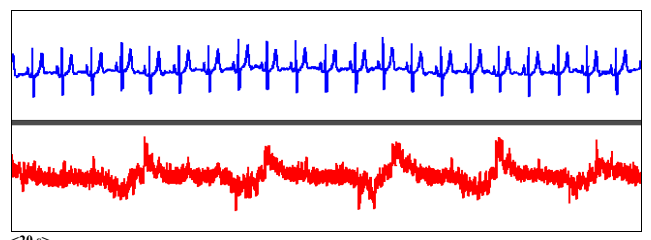


Figure 3a: ECG / EMG – data before WLAN-exposure.

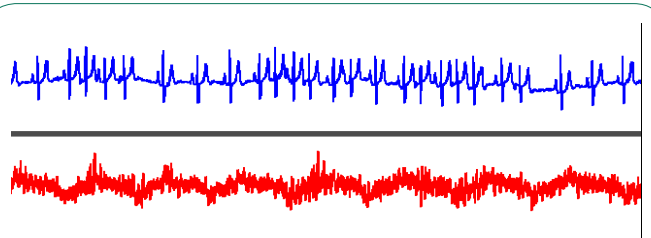


Figure 3b: After 6 min WLAN- exposure.

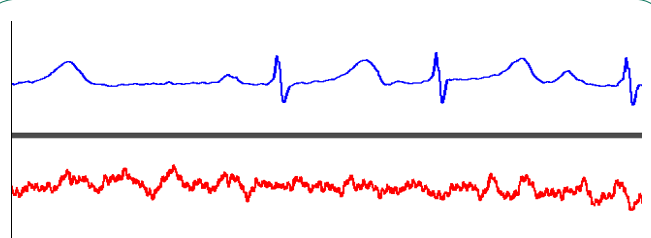


Figure 3c: Same as in figure 3b (record-time: 2 s).

During WLAN-exposure in this case there was not found any influence on EMG but there are ECG-events pointing to a threatening cardiovascular problem by this electromagnetic field.

Conclusions

The influences in EMG during and after WLAN-exposure are obviously depending of the individual biosystem as demonstrated by the different data. That means: there is no uniform effect on biosystem by WLAN-exposure. But by these demonstrated effects there must be a discussion about the consequence of artificial signals in the nervous system with following interactions of biofunctions, e.g. in cardiovascular system.

The demonstrated data point to the necessity for a new discussion about healthy effects by low-energetic electromagnetic exposures. That especially under the background of longtime WLAN-exposure in "home-office" or in schools by "digital-learning". The precautions by ICNIRP-guidelines are not relevant.