NEUTRALISING PROTECTIVE DEVICE AGAINST CELLULAR PHONE RADIATION. FIRST BIOMEDICAL ESSAYS .

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OBJETIVES

The goal of this study is to test the efficiency of the neutralising protective device, Gamma -7.-RT ® ,(EP 0 838 208 A1), against undesirable radiation from mobile phones, thus, opening a line of research within the field of biomedical engineering intended to protect our health.

METHODS

Under electromagnetic-environment controlled conditions EEG records have been obtained in 16 healthy subjects, with their eyes open at the base-line. These records were compared with the use of the mobile phone with and without the neutralising protective device for five minutes each, and having them statistically tested with Wilcoxon matched-pairs.

RESULTS

The FFT application shows a coloured mapping of the distribution of brain frequencies (see fig.2 a,b,c) ASCII format frequency distribution tables are obtained from the maps and statistical analysis of the four ranks of brain frequencies already studied :Delta (0,5-3,5 Hz), Theta (4-7,5 Hz), Alpha (8-12,5 Hz) and Beta (13-30 Hz) are then carried out.

Percentage distribution of brain frequencies under study, with the NPD on, tends to be the same as the initial basal state of the subject at the start of the experiment. This is observed as we analyse the average data for all the electrodes. However, when the subject is listening without the NPD, a significant statistical variation in the percentage of brain rhythms is observed (Fig. 3) The greatest differences found were registered in the frontal electrodes Fp1, Fp2, F3 and F8. (Fig. 4).

See figures 5 a, b for analysis of these differences. As the basal state is compared, we can see that without the NPD the Delta frequency decreases, whereas the Theta frequency increases. Nevertheless, as the basal state and the use of the NPD are compared, only minimal differences are observed. In all comparisons a statistically significant p is observed.

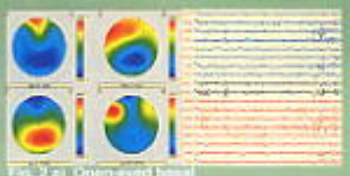


Fig. 2 a) Open-eyed basal

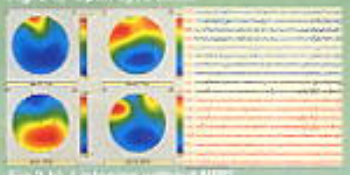


Fig.2 b) Listening without NPD

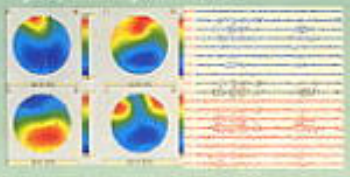


Fig 2 c) Listening with NPD

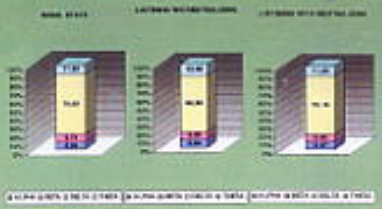


Fig.3 Histograms representing brain frequency percentages in the three setting conditions under study.

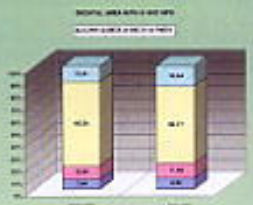
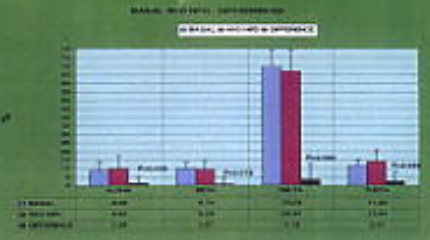
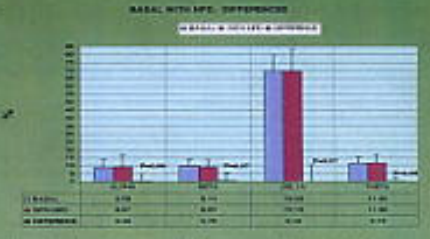


Fig 4.- Comparison of frequency percentage histogram at the frontal area with and without NPD.





Figs. 5 a, b.- Histogram of Means and Standard Deviation of the four brain frequencies under study and their differences when comparing the basal state with and without NPD.

OBSERVATIONS

It is worth noting that when the ear-lobules grounded electrodes were not in close contact with the skin, the phone signal polluted the EEG course, (fig. 6a,b). Without altering the setting, the NPD was placed on the phone and the recording was kept going. The pollution signal decreased to the point of practically disappearing which meant the NPD reduced the signal.

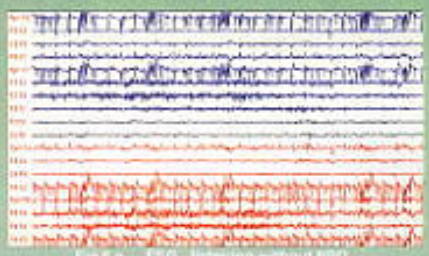


Fig 6 a.- EEG , listening without NPD.

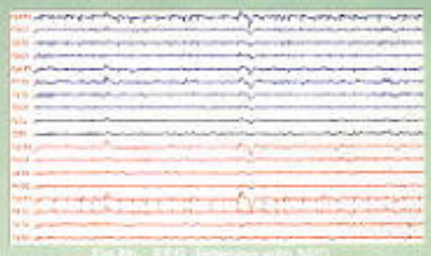


Fig 6b.- EEG listening with NPD

CONCLUSIONS

The use of the neutralising protective device, Gamma -7.-RT ®, is clearly a good protection against undesirable radiations from mobile phones.

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