ELF-PULSATING MAGNETIC FIELD (PEMF)-INDUCED ACOUSTIC EFFECTS IN VESSEL WALLS - AN ADEQUATE STIMULATION OF BARORECEPTORS?

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INTRODUCTION

In the year 1979 we published the results of our preliminary experiments. PEMFs with impulse package frequencies in the ELF-range modify the infrared radiation (3-10 μm) of local areas of the body surface in humans. This occurs in single cases already at magnetic induction values of dB/dt < 500 mT/sec when the field is applied to the head-thorax-area (Fig. 1).

Fig. 1. Modification in the IR-radiation (wavelength 5μm) of the human legs during application of PEMF at the neck. Characteristics of the field are described in the text. The time between each picture is 2 minutes.
The reaction appears mostly within two minutes in the arms, hands and legs. The thermograms and the method of IR-plethysmography clearly indicate that the continuously increasing energy irradiation of the body originates at the blood vessels. The reason for this is definitely a dilation in the larger vessels.

The direct consequence of a modified blood circulation in tissue caused by certain pulsating magnetic fields is an alteration of the oxygen partial pressure in tissue. PEMF with special characteristics can rapidly increase the $pO_2$ measured transcutaneously.²

In new experiments we got further results: PEMFs with different special impulse forms, impulse repetitions and amplitudes increase or decrease the respiration cycle, the heart rate, the blood pressure and vessel perfusion (Fig. 2).

![Fig. 2. Central effects of PEMFs with specific characteristics on the circulation system of the human body. The PEMF is applied at the neck.](image)

The magnitudes induced by the PEMF accordingly affect the information memory and information conveyance of the automatic nervous system.

The registered effects are subjected to great fluctuation and poor reproducibility. They can be explained by a central reduction and alternatively by a local increase in the activity of the sympathicus.