Editorial

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Magnetic Therapy of Chronical Destructive Pulmonary Disease (COPD)

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Editorial

In the present paper I describe the causes, symptoms and the possible treatments of the Chronical Destructive Pulmonary Disease (COPD). I explain the physical processes underlying the magnetic therapy of this disease.

COPD, causes, symptoms and possible therapies: The main cause for COPD is extensive smoking over a long time. In persons with extensive smoking the numbers of particles which can cause an inflammation, e.g., macrophages, neutrophils, eosinophils etc. are larger than in non-smoking persons and this gives an inflammation of the lung which produces the problems of COPD. The main symptoms are shortage of breath, sounds during outbreathing, ejections, pressure feeling on the breast, etc. Possible treatments are stopping of smoking, inhalations, surgery and in the worst case lung transplantation.

Magnetic therapy of COPD: I now describe the magnetic therapy of COPD, with an emphasis of explaining the underlying physical processes. In this therapy there is an application of an external time-varying electromagnetic field.

There are also medical drugs applications, which however can have severe side effects. The magnetic therapy is easy to apply, it does not have side effects and therefore it is superior to the application of medical drugs.

A time-varying electromagnetic field is described by

$$E = E_0 \cos(\omega t - k r), \quad (1)$$

$$B = B_0 \cos(\omega t - k r) \quad (2)$$

Here E is the electric component of the electromagnetic wave and B is the magnetic induction. The electromagnetic wave carries energy and part of this energy is absorbed in the blood vessels. This gives a small amount of tissue warning. Furthermore, the charged particles in the blood, manly Ca^{2+} ions, feel a Lorentz force.

$$F = q E + q (v \times B) \quad (3)$$

Where q is the charge of the particle, v is the velocity of the charged particle in the human blood. This Lorentz force gives a contribution to the energy of the blood and part of this energy is again absorbed in the blood vessels, giving again a small amount of tissue warming. A warming up increases the diameter of the blood vessels and it increases thereby the velocity of the blood low. As a result the oxygen particles in the blood which heal the inflammation come more rapidly to the site where it is required.

As said above the inflammation is one very important cause for COPD diseases. In the case where this disease does indeed result from an inflammation, the described magnetic therapy yields an improvement of the symptoms of the COP disease.

I want to note that the Lorentz force appears also when applying a static external magnetic field, not just when applying a time-varying electromagnetic wave.

In the present paper I describe the causes, symptoms and possible treatments of the Chronical Destructive Pulmonary Disease (COPD). I concentrate on the magnetic therapy of COPD when this is caused by inflammations of the tissues. I describe the physical processes underlying this therapy. This is a further very interesting application of electromagnetic fields to treat human diseases, e.g., the pulsed electromagnetic field treatment of cancer.