The Role of PEMFs in Helping with the Management of COVID-19 infections*

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For COVID-19 infection, it's worth considering the role of PEMFs in the various phases of infection: as prevention, in the incubation period, in the 3 phases of active COVID-19 infection (viremia, acute phase and recovery), in convalescence and longer-term for healing of the infection-damaged tissue. Before Some of the effects of PEMFs on helping the body to fight and prevent viral infections is reviewed in Dr. Pawluk's book, Power Tools for Health: how pulsed magnetic fields [PEMFs] help you. (pp 25-28). These effects tend to be nonspecific. At this point, there is little research to show that PEMFs can kill viruses, in general, or the coronavirus specifically. So, most of the strategies for the use of PEMFs have more to do with health maintenance and prevention, early infection stage and during recovery and repair.

Prevention

For infection preventive purposes, in the light of the coronavirus pandemic, a lower intensity PEMF system of about 200-1000 Gauss, whether portable (DC) or needing current (AC), applied over the thymus would help to stimulate T cells. This is especially important since one of the key aspects of aggressive COVID-19 infection is the initial and progressive reduction in lymphocytes. The thymus is located under the upper part of the sternum inside the chest. It may be worthwhile, although hypothetical, to stimulate the thymus with a PEMF to "stoke" and optimize the immune system, especially during this time of the pandemic.

Death is more likely to occur by multiorgan failure, most often in elderly and those with underlying health conditions, such as, seen in smokers, uncontrolled hypertension, cardiovascular disease, diabetes. [10] The list of those who are most vulnerable would include those with significant underlying lung disease or in those who are significantly immunocompromised including, but not limited to, organ transplants, active chemotherapy with low white blood counts, immunosuppressive medications, and generally low immune function, such as seen in the very elderly.

PEMFs have been found helpful for numerous health conditions that lead to COVID-19 infection risk. These include the lungs of smokers, those with COPD, asthma, and other lung diseases, cardiovascular disease, diabetes, chronic organ failure and those who are immunocompromised.

I previously reported that PEMFs have a significant role in decreasing inflammation, and cytokine burden, throughout the body by actions on the adenosine receptor. [23] There is also increased inflammation and production of significant amounts of pro-inflammatory cytokines in the setting of overweight and obesity, leading to a pre-existing cytokine burden. [24] Overweight and obesity are especially common in diabetes and diabetes is a risk factor for increased severity of COVID-19 infection. [10] PEMFs can reduce this cytokine burden.

Routine daily in-home treatment with whole body or local PEMFs for those at-risk help to decrease inflammation in the body, support the tissues to be as healthy as possible, so that these individuals could be maximally protected prior to infection.

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Incubation

Since a large percentage of people are as of May 2020 are COVID-19 antibody negative, they are likely to be asymptomatic as they become infected and proceed to initiate viral spread. For this reason, routine use of a PEMF for health maintenance is likely to create a healthier body with less inflammation burden prior to infection.

Even though not directly related to COVID-19 infection, one study [20] investigated mice with intranasal injection of H1N1 influenza virus and treated with a 2 kHz PEMF at 1 uT, 10 uT, 100 uT, and 1000 uT for 7 days and 30 minutes per day and compared to a control group. In the control group influenza virus titers in the lungs increased from 800 [days 1 – 2] to 3200 [days 3 – 5], then fell to 1600. In the PEMF treatment groups, the influenza virus titers did not exceed 800 in the 1 uT group, and only 400 and the 10 and 100 uT groups. Influenza virus antibody levels were 20 in the control group and up to 320 in the 1 uT group at 640 in the the 10 and 100 uT groups. All these changes were significant at the $p<0.01$ level. Interestingly, mice in the 1000 uT group had much more severe disease succumbing by the 3 rd day after infection. While infected mice seemed to have increased resistance to H1N1 infection with this PEMF treatment system, the results may not be able to be extrapolated either to coronavirus infections or to humans.

For use in the incubation phase, PEMFs stimulate phagocytosis. [19, p 26] So, once the virus begins to incubate in the nose, routine use of PEMFs before or during the time of viral invasion may be more likely to impact the proliferation of the virus by lessening its production.

Acute infection

It is unknown how effective PEMFs might be if only initiated during the viremia and acute phase of infection. During any acute inflammatory process, there is an explosion of production of and demand for ATP. PEMF's are known to increase the production of ATP. [21] So, the only possible mechanism I can think of to assist this process, might be the ability of PEMF's to help the body produce more ATP molecules that are required during the acute phase of infection to control inflammation. Since ATP production, breakdown and recycling is an ongoing daily process in the body, daily use of PEMFs is probably necessary. It has been reported that the body produces approximately its own weight in ATP throughout the day, with each ATP molecule recycling from 200 to 500 times a day.

PEMFs, by virtue of their action on adenosine receptors during acute inflammation [22], may conceivably enhance the degree of acute inflammation as part of the process of resolution of the infection. That's why in some of the older PEMF literature there is a recommendation for limiting the use of PEMFs in acute infections. So, while it's possible that PEMFs may enhance the acute inflammatory process to get those infected through to resolution faster, there is likely to be some degree of uncomfortable or unacceptable aggravation first. In the setting of sepsis, this accentuation of inflammation may be very undesirable. This is why I generally do not recommend starting PEMFs de novo or as a sole therapy during actively developing significant acute infection. From this perspective, PEMF's would be best used by "bracketing" the infection, preventively ahead of it, to decrease the likelihood of it happening, and after some degree of resolution of the acute infection, to speed recovery and repair.

Once hospitalization is necessary, is highly unlikely that PEMFs would be admitted for use in the acute care setting. Therefore, there is no experience to suggest a possible role at this time in this setting.

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While PEMFs have been found to inhibit mutagenic transformation of bacteria and have no mutagenic effects of their own. Also, the magnetic fields were not co-mutagenic in combination with chemical, oxygen or physical mutagens, like UV radiation. There is no research to suggest that PEMFs would do the same for viruses, but the possibility, at least theoretically exists.

PEMFs also been found to increase the effectiveness of antifungal agents. One study found that the combination killed almost 90% of the fungi versus only 43% with medication alone, even though the medication was used for longer period of time.

In one study using an inflammatory arthritis model, a PEMF applied to herpesvirus infected cells did not affect the growth and viability of the cells. However, the viruses developing under PEMF exposure had mainly defective viral particles. This benefit of the PEMFs would give the tissue an opportunity to heal while potentially rendering the virus less active.

Recovery, convalescence and long-term healing.

Because of the general effect of PEMFs on inflammation, regardless of the source and cause, PEMFs should significantly reduce inflammation associated with coronavirus infections. A recent review [25] discussed the value of PEMFs (or extremely low-frequency magnetic fields – ELF-MFs) for reducing chronic cellular danger signals that lead to inflammation and immune cell activation and for promoting cellular and tissue healing caused by infection.

The adenosine blog makes it clear that an appropriate intensity PEMF is needed to produce optimal reduction of inflammation. The optimal PEMF intensity is 1.5 mT/15 Gauss at the target tissue. [26] The peak intensity of the magnetic field will depend on the amount of lung tissue that needs to be treated. If the problem is primarily in the bronchial passages, the magnetic field intensity, at about 3 – 4 inches into the body needs to be at a minimum of about 2000 Gauss, and preferably 4000 Gauss. If major areas of the lungs are involved, a wider field PEMF system delivering about 5000 Gauss would be needed to be used to both the front and back of the chest, and over both lungs.

PEMFs have been found to stimulate RNA, DNA, fibroblasts, collagen and stem cells. All of these effects are covered in Power Tools for Health.

As a result, as soon after infection as possible, PEMFs should be considered in the rehabilitation or recovery phase at home after hospitalization, even if ARDS happened. The goal will be to reduce the amount of inflammatory damage and scarring of pulmonary, alveolar and bronchial, tissue as the body goes through the recovery and healing process. Given that the virus affects other ACE2 receptors throughout the body and the viremia can be damaging to other tissues as well, healing and recovery would be expected to be significantly accelerated, reducing the risk of secondary infections and complications.

Even long after recovery from COVID-19 infections, PEMFs may still be very important to heal the affected lung tissues to the extent possible to improve air exchange. [19, p 43] This is especially true in those with clear scarring on CT or reduced pulmonary function testing. In this situation, it is likely that PEMFs will be needed long-term to maintain lost or damaged function and facilitate longer-term lung healing. [27]

Conclusion

PEMFs should be used early and aggressively in the initial, less symptomatic, stages of any viral infection. Once an infection gets to the point of requiring hospitalization, PEMFs are not likely to be allowed into the hospital setting. So, PEMFs should be considered in the rehabilitation or

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recovery phase at home after hospitalization, even if ARDS happened. The goal will be to reduce the amount of inflammatory damage and scarring of pulmonary, alveolar and bronchial, tissue as the body goes through the recovery and healing process.

There is no known curative treatment for COVID-19virus at this time. Immunization is still a long way off. While PEMFs cannot be considered a panacea, they could be very supportive to help with any other therapeutic approaches, including antivirals.

In addition, routine, daily, systemic/whole body use of PEMFs, prior to any infections, will tend to reduce the inflammatory burden throughout the body and optimize cellular function, through various mechanisms. A healthy body is more likely to resist any viral infections in the first place and, once infected, the body is less likely to have infection progress and produce significant symptoms.

References

1. Kuchar E, Miśkiewicz K, Nitsch-Osuch A, Szenborn L. Pathophysiology of Clinical Symptoms in Acute Viral Respiratory Tract Infections. Adv Exp Med Biol. 2015;857:25-38.
2. https://www.popsci.com/story/health/how-diseases-spread
3. Rodriguez-Morales AJ, Cardona-Ospina JA, Gutiérrez-Ocampo E, et al. Clinical, laboratory and imaging features of COVID-19: A systematic review and meta-analysis. Travel Med Infect Dis. 2020; Mar 13:101623.
4. Lai CC, Liu YH, Wang CY, et al. Asymptomatic carrier state, acute respiratory disease, and pneumonia due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2): Facts and myths. J Microbiol Immunol Infect. 2020; Mar 4. pii: S1684-1182(20)30040-2.
5. Lin L, Lu L, Cao W, Li T. Hypothesis for potential pathogenesis of SARS-CoV-2 infection--a review of immune changes in patients with viral pneumonia. Emerg Microbes Infect. 2020; 20:1-14.
6. Verity R, Okell LC, Dorigatti I, et al. Estimates of the severity of coronavirus disease 2019: a model-based analysis. Lancet Infect Dis. 2020 Mar 30. pii: S1473-3099(20)30243-7.
7. https://www.rndsystems.com/resources/articles/ace-2-sars-receptor-identified
8. Diamond M, Peniston Feliciano HL, Sanghavi D, Mahapatra S. Acute Respiratory Distress Syndrome (ARDS). StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan.
9. https://en.wikipedia.org/wiki/Pulmonary_alveolus
10. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet. 2020; 395(10223):497-506.
11. Pierrakos C et al. Acute respiratory distress syndrome: pathophysiology and therapeutic options. J Clin Med Res. 2012 Feb;4(1):7-16.
12. Nüssing S, Sant S, Koutsakos M, et al. Innate and adaptive T cells in influenza disease. Front Med. 2018; 12(1):34-47.
13. Wang BX, Fish EN. Global virus outbreaks: Interferons as 1st responders. Semin Immunol. 2019 Jun;43:101300.
14. Prompetchara E, Ketloy C, Palaga T. Immune responses in COVID-19 and potential vaccines: Lessons learned from SARS and MERS epidemic. Asian Pac J Allergy Immunol. 2020; 38(1):1-9.
15. Zhang P, Li J, Liu H, et al. Long-term bone and lung consequences associated with hospital-acquired severe acute respiratory syndrome: a 15-year follow-up from a prospective cohort study. Bone Res. 2020 Feb 14;8:8.

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16. Devaux CA, Rolain JM, Colson P, Raoult D. New insights on the antiviral effects of chloroquine against coronavirus: what to expect for COVID-19? Int J Antimicrob Agents. 2020 Mar 11:105938.
17. Gao J, Tian Z, Yang X. Breakthrough: Chloroquine Phosphate Has Shown Apparent Efficacy in Treatment of COVID-19 Associated Pneumonia in Clinical Studies. Biosci Trends. 2020; 14 (1), 72-73.
18. Dong L, Hu S, Gao J. Discovering Drugs to Treat Coronavirus Disease 2019 (COVID-19). Drug Discov Ther. 2020; 14 (1), 58-60.
19. Pawluk W and Layne CJ. Power Tools for Health: how magnetic fields (PEMFs) help you. Publ. Friesen Press, 2017.
20. Mirtskhulava MB, Tsibadze DA, Sibashvili GS, et al. The effects of magnetic field on influenza virus distribution in body organs. Vopr Kurortol Fizioter Lech Fiz Kult 1995; (2):24.
21. Zhang S, Clark M, Liu X, et al. The Effects of Bio-inspired Electromagnetic Fields on Healthy
22. Enhancement with Case Studies. Emerging Science Journal 2019; 3(6):369-381.
23. Varani K, Vincenzi F, Ravani A, et al. Adenosine receptors as a biological pathway for the anti-inflammatory and beneficial effects of low frequency low energy pulsed electromagnetic fields. Mediators Inflamm 2017:2740963.
24. https://www.drpawluk.com/blog/pemfs-and-adenosine
https://www.drpawluk.com/blog/overweight-obesity-and-pemfs
25. Rosado MM, Simkó m, Mattsson MO, Pioli C. Immune-Modulating Perspectives for Low Frequency Electromagnetic Fields in Innate Immunity. Front Public Health. 2018; 6: 85.
26. Massari L, Benazzo F, De Mattei M, et al. CRES Study Group. Effects of electrical physical stimuli on articular cartilage. J Bone Joint Surg Am. 2007; 89 Suppl 3:152-61.
27. Jerabek, J and Pawluk, W. Magnetic therapy in Eastern Europe: a review of 30 years of research. Publ. Advanced Magnetic Research of the Delaware Valley, Chicago, 1996.

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