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Abstract

Background: Earthig is a contact with earth by several means that could cause influx of electron into the body with subsequent anti-inflammatory effect, immunity enhancement, anticoagulation, rising blood oxygenation, and possible antipyretic effect. All these effects of earthing might have a substantial role in the management of patients with COVID-19 infection without deleterious side effects of ordinary medications.

Objective: to investigate the role of earthing in treatment and prevention of COVID-19 infection.

Design: Observational study

Setting: University of Basrah, College of Medicine, Iraq.

Patients: The study included 59 cases with COVID-19 infection.

Interventions: All patients conducted earthing through direct contact with earth or connecting apparatus for about 15 min-3 hours/day.

Measurements and Main Results: The diagnosis was confirmed by PCR test with or without chest CT-scan. There was spectacular response in a severely ill patient who was unable to speak due to dyspnea with blood oxygen level 38% on continuous oxygen supply. On the second day of three hours daily earthing, his oxygen level raised to 95% with oxygen supply and 77% without oxygen supply. After 1-3 days of earthing, most patients revealed improvement of the following symptoms: fever, dyspnea, cough, weakness, headache, chest pain, taste and smell sense loss, anorexia, and body pain. Six people were in contact with COVID-19 patients that had performed preventive earthing. They contracted mild or short-lived illness although their household were severely affected.

Conclusions: The outcome of patients with COVID-19 who had performed regular and sufficient earthing showing significant curing or preventive effects that more studies on larger sample size are advocated.

Introduction

There is a lot of controversy in regard to medications for COVID-19 infection such as hydroxychloroquine, steroid, and convalescent plasma. Vaccine development and production is still ongoing without a significant breakthrough. At the current time, there is no approved medication for COVID-19 [1,2,3]. There are many modalities of treatment although none of them prevent complications and death. In regard to steroid use, there is no conclusive evidence about safety. It was used as anti-inflammatory agent. Steroid administration in patients with COVID-19 was associated with increased death rate, secondary bacterial infections and complications such as, increased blood sugar, psychosis, delayed viral clearance and raised mutation rate of the virus [4]. On the contrary, earthing has anti-inflammatory effect and enhances immunity as well [5,6]. Studies on the efficacy of chloroquine and hydroxychloroquine are inconclusive, that further studies are justified [7]. Several studies have demonstrated efficacy of certain antiviral agents to treat COVID-19. Remdesivir was found to be active in several COVID-19 patients, preclinical studies of SARS-CoV and MERS-CoV infections, and in mice by acting on the viral polymerase with subsequent premature termination of viral replication [8,9,10].

The reason for death in COVID-19 infection is suspected to be the “cytokine storm”. Cytokine storm is an activation cascade of auto-amplifying cytokine production as a result of dysregulated host immune response to different triggers among them are infections [11]. The proinflammatory cytokine, Interleukin-6, is a major mediator in the acute inflammatory response and with cytokine storm. It was reported to be elevated above the normal range in patients with COVID-19 [12,13].

The earth’s surface has unlimited and constantly regenerated supply of free electrons. It is electrically conductive, and its electron supply is renewed by the global atmospheric

electrical circuit [14,15]. It has been suggested that free or mobile electrons from the earth could improve chronic inflammation by favoring as natural antioxidants [16]. The effect is proposed by free electrons influx that absorbed into the body through direct contact with the earth probably neutralizes free radicals and, that way, minimizes acute and chronic inflammatory events [5].

This study was carried out to investigate the role of earthing in prevention and treatment of COVID-19 infection. To the best of my knowledge, this is the first study that assess the clinical outcome of COVID-19 infection after application of grounding.

Patients and Methods

The study was conducted at Basra province during the period of May 28, 2020 to November 5, 2020. An observational study that carried out on 59 patients with confirmed COVID-19 infection. The diagnosis was confirmed by positive PCR results, with or without chest CT-scan. The research protocol was reviewed and approved by the Ethics Committee of the College of Medicine, University of Basrah, Iraq, under the Institutional Review Board at session number 15, 2020. Consent to participate was obtained from each patient or his or her guardian. Approval to conduct the study from Ministry of Health has not been obtained yet and it is still in processing state, therefore, the study included only cases who were managed outside hospitals. There were many severely ill patients who had requested discharge from hospitals upon their responsibility.

The patients were instructed to connect with earth by several feasible methods. The same instruction were also provided for some people who were in contact with patients as preventive measure. Earthing was carried out by walking bared feet on non-insulated ground, preferably wet type, or insertion of conductive metallic bar in the earth that were connected with conductive wire and plate to patient's body. The body could be grounded by means of a conductive patch or earthing sleep system on a bed's mattress that is connected to a building's earthing system. Contact with green plants, where their roots directly inserted into the earth, is also regarded as a good earthing resource. House floor covered with ceramic, porcelain, granite, marble, wood, plastic, or carpet is regarded as non-conductive. It is recommended to connect the body with the earth directly or naturally, away from electrical interference from the building's systems or from electrical apparatus [6].

Questionnaires were provided for patients that included symptoms, temperature, Oxygen blood level if available, method and duration of earth connection, subjective feeling after

earthing, and progress after earth connection during next few days, Supplement 1. Laboratory investigations and chest CT- scan were also recorded for some patients. The progress of disease was scrutinized on phone call follow up or direct patient visit.

After earth conducting, the patients were instructed to record the signs of improvement or non-improvement such as temperature, Oxygen saturation, and other symptoms relief.

The patients were on medical treatment protocol according to severity of illness except 14 cases who were not taking any medicine when starting earthing. They were instructed to not suspend any medication during grounding application and consult their physicians as usual. The following medications were administered according to patient's condition: Oxygen supply, i.v. fluid, heparin, convalescent plasma, paracetamol, acetylsalicylic acid, azithromycin, ceftriaxone, avifavir, oseltamivir, prednisolone, dexamethasone, vitamin C, Zinc, and vitamin D.

Results

Fifty-nine patients were studied. The age of patients range 32-88 years (mean 53 years). The illness was severe in 20 cases, moderate in 28 cases, and mild in 11 cases, Figure 1. Six patients with confirmed infection (age: 32, 58, 59, 47, 49, 38 yr.) experienced mild symptoms or short duration illness after conducting regular earthing before contracting the illness as preventive measure, Table 1. Of whom, three patients experienced mild fever, two patients had productive cough, and one patient had body pain and loss of taste and smell sensation. The most striking outcome was observed in 56 year old patient. He was admitted to hospital because of dyspnea, cough, fever, and blood Oxygen level 74%. PCR for COVID-19 was positive. The patient was given continuous Oxygen supply, antiviral Avifavir, i.v. fluid, Prednisolone, Azithromycin, i.v. Ceftriaxone, and convalescent plasma infusion. There was no improvement during staying in the hospital for one week. The patient requested discharge from the hospital upon his responsibility. At home the patient had continued on prescribed medical treatment and continuous Oxygen supply. By the end of second week of acquiring the infection, he was extremely deteriorated. He was unable to speak any word because of severe dyspnea. The Oxygen level on oximeter measurement while the patient on continuous Oxygen administration was 38%. Chest CT scan showed more than 70% involvement of lungs. As the patient could not sit or leave his bed to perform earth contact, the patient's son was instructed to perform earthing to the patient by means of wire and plate that connected him to ground. Substantial improvement was noticed on the second day after two sessions earthing (3 hr/day). Oxygen level increased to 95% while the patient on Oxygen supply and 77% without Oxygen administration. Full recovery established after three days on 3 hr daily earthing that he was just complaining from weakness and exhaustion for further one week. A 65-year old woman was severely dyspneic who admitted to hospital for oxygen supply and discharged for continuous Oxygen therapy at home. She was also improved after 40 minutes

earthing session after which she required intermittent Oxygen supply. Forty-three year old man who was admitted twice in the hospital for Oxygen supply. He conducted earthing for 30 minutes daily at home after discharge from the hospital. He acquired complete improvement after three days of earthing. A 68-year old man with severe illness, who had hypertension and diabetes mellitus. He died in the hospital as a result of cerebrovascular accident (CVA) that was demonstrated as ischemic stroke on brain CT- scan. He was on medical treatment in addition to implementation of twice brief earthing for 15 min/day on every other day which was commenced on the 12th day of illness. Two women with severe illness were not improved on full protocol of medications and earthing instruction. Afterward, they were lost follow up. The other 14 patients with severe illness were improved on regular medications and sufficient earthing without any complications. Another 73 year aged patient with severe illness who was complaining from critical dyspnea. He was on continuous Oxygen supply and prescribed medications. He refused applying earthing apparatus to his body. He died on the next day as a result extreme hypoxemia while he was at the second week of illness. Sixty-seven year aged diabetic patient at 3rd week of moderate illness who was complaining from continuous fever, body pain, anorexia, and loss smell and taste sensation. A significant improvement on the second day by approximately 2 hr daily grounding. There was settlement of fever, and recovery of smell and taste sensations. All other patients with moderate or mild illness were improved significantly within one to three days after 15 min. -3 hours daily earthing. Complete recovery in patients who started early earthing (within the first five days of the illness) ranged from 1-16 days (mean 8 days), Table 1. The following symptoms were recorded to be improved after earthing: fever, dyspnea, cough, sore throat, weakness, headache, chest pain, taste and smell sense loss, anorexia, and body pain. Nine patients with risks factors were also improved after earthing, Table 2.

Discussion

The outcome of most patients in the present study revealed significant improvement after one to three days of earthing. Nine patients with risk factors were improved on earthing procedure. Moreover, 17 severely affected patients out of 20 with or without risk factors were improved following earthing as well. It is well known that an overwhelming inflammatory response is the cause of human deaths from influenza infections [17]. Severe acute respiratory syndrome COVID-19-induced infection can be associated with a coagulopathy, findings concordance with infection-induced inflammatory changes as noticed in patients with disseminated intravascular coagulopathy [18]. Best way to avoid the suppression of anti-viral immune response is to choose selective instead of broad immunosuppressive drugs. Corticosteroids and other immunosuppressive therapies have anti-inflammatory effect although they hamper the immune system. On the other hand, anticoagulation by acetylsalicylic acid might enhance metabolic acidosis which could deteriorate patient's condition who has respiratory acidosis. Earthing has revealed anti-inflammatory effects [5] and improvements in the immune response [19] and both effects have been shown to be mandatory for influenza treatment [6]. In addition, earthing was shown to promote immune response following vaccination by increasing gamma globulin level [19]. Connection with earth has also been shown to reduce red blood cells (RBCs) aggregation, and blood coagulation by increasing the zeta potential of RBCs. The zeta potential is a parameter that indicates the number of electrons on RBC surface. A greater number of zeta potential is associated with a higher ability of the RBCs to repel each other. Subsequently, the higher surface RBC negative charge is, the blood has less tendency to coagulate. Grounding has been demonstrated to enhance the surface negative charge on RBCs and thus decreasing blood viscosity and clumping [20,21]. Hypoxemia is another major cause of mortality in patients with COVID-19 infection. A Randomized controlled trial study revealed that

earthing had caused decreased blood oxygenation during 40 minutes grounding, followed by a dramatic increase in blood oxygen level after ungrounding [22]. Therefore, earthing could improve blood oxygenation significantly in COVID-19 patients with hypoxemia. From a historical point of view, American Indians have had a faith in the healing ability of the earth. They have a tradition to bury patients from all types of illnesses in the earth up to their necks for some hours. A mud bath is valuable in producing rheumatic pain or joints pain relief caused by injuries, while mud packs have beneficial effects in fever reduction, treatment of influenza, measles, and scarlet fever [23]. People in rural areas with predominant earth or green plants contact may obtain prevention from COVID-19 infection that might be explained by lower number of cases in rural than cities areas. Furthermore, the high incidence rate of CIVID-19 in certain cities in developed world might be related to character of the houses' floor which are made from non-conductive materials such as woods, marble, porcelain, ceramic or plastic. Most people in the cities are used to wear insulated shoes without earth contact. The detachment from earth might lead to accumulation of positive body charges or free radicles that could interfere with normal immune response and the cells of the immune system that has to be investigated by further studies. Grounding might convert unregulated cascade of host immune response into a regulated one that prevent cytokine storm and death.

Therefore, the anti-inflammatory, anticoagulation, immunity enhancement, blood oxygenation promotion, and fever reducing effects of earthing could have vital role in COVID-19 infection cure and prevention. The healing effects of earthing on COVID-19 infection deserve extensive investigations. It might have a major impact globally. It is a cost-free treatment that could save thousands of lives. It could conserve a significant budget that spent for medications, vaccines and other more healthcare resources as well.

The limitations of the present study were small sample size, the study carried out on non-hospitalized patients, many patients were on usual treatments, and there was no control group without earthing for outcome comparison. Further studies are required that involve large sample size, hospitalized patients, and more patients with severe illness.

Conclusion

Earthing or grounding might have significant impact in the management of patients with COVID-19. The main complications of the illness are hypoxemia, coagulopathy, inflammation, and immune defect which endanger the patient's life. All these complications could be relieved by earthing without the deleterious side effects of the drugs and without cost as well. It is advised to perform sufficient and regular earthing for at least 40 minutes daily for prevention or treatment of COVID-19 infection. Earthing could be applied at any stage of the illness although earlier is better. It is more effective when conducted on wet muddy earth type. It might be effective for other respiratory viral infections such as influenza. Even under the circumstances of vaccine availability, it could be employed after viral mutation or future new pandemic emergence that the manufactured vaccines cannot work anymore. In addition, vaccines demand prolong time for development and continuous revision in case of viral mutation whereas resistance to antiviral medications might be developed at any stage of the pandemic.

It is recommended to apply earthing as adjuvant to current medical treatment protocol and preventive measure for COVID-19 infection though not replacing the approved medications or prospective vaccines in management or prevention of the illness.

After searching the electronic databases, no previous study is found that investigates the role of earthing in prevention and treatment COVID-19 infection. For the first time, the current

investigator (Mousa 2016, Mousa 2017) has recommended earthing as a mean for prevention and treatment of respiratory viral infections [6,17].

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Figure legend

Figure 1. The outcome of 59 patients with COVID-19 infection. Flowchart showing the outcome of 59 patients with COVID-19 infection after conducting earthing procedure. Twenty patients had severe illness of whom 17 got improvement without any complications. One patient died who did not perform adequate earthing. Two patients had lost follow up. The other 39 patients with moderate and mild illness acquired complete recovery after earthing.

Figure 1. The outcome of 59 patients with COVID-19 infection.

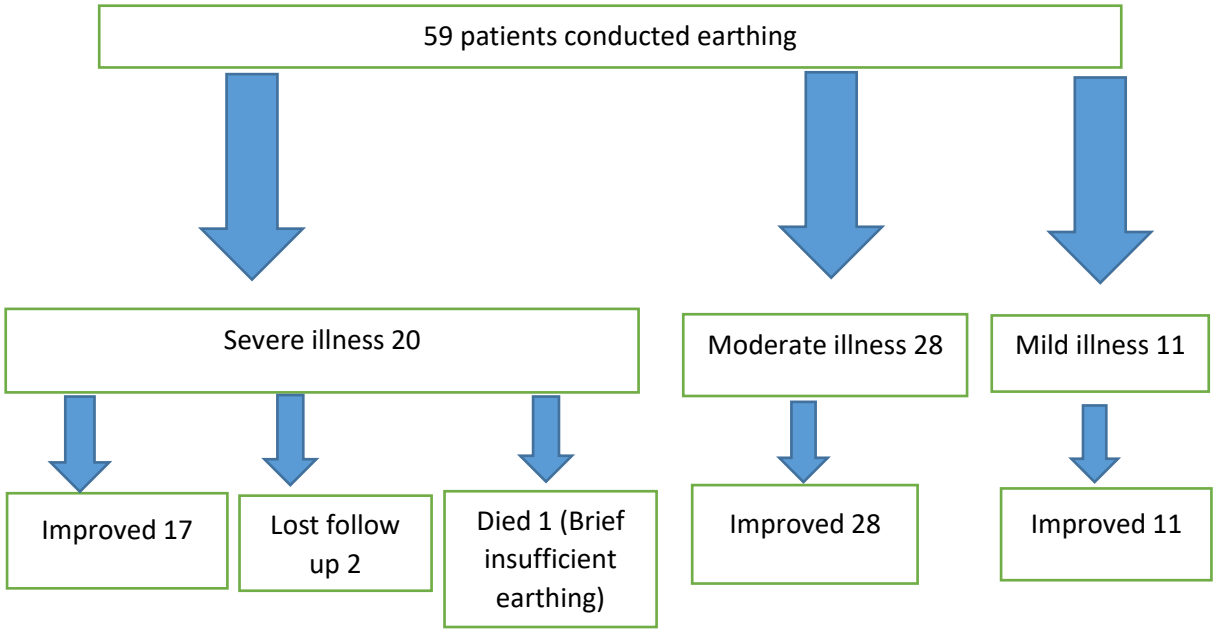

Table 1. Duration of illness in patients who performed prophylactic or early earthing within the first five days of disease.

Age/Sex	Complaints	Earthing duration	Illness Duration/day
*32 F	Fever	½ hr/day for 7 days	5
*58 M	Fever	Prophylaxis 1 hr/day for 35 days	1
*59 M	Productive cough	Prophylaxis 2 hr/day for 60 days	14
*47 F	Fever	Routine daily bared feet walking	2
*49 M	Productive cough, runny nose	Routine daily bared feet walking	15
*38 M	Body pain, loss of taste & smell sensation	Prophylaxis 15 min daily bared feet walking	4
42 F	Body pain, headache weakness, anorexia, sore throat	3 hr/day for 12 days	16
45 M	Headache, weakness	½-3 hr/day for 10 days	12
61 F	Fever, body pain	1 hr/day for 5 days	7
45 M	Fever, headache, body pain, anorexia, sore throat	1 hr/day for 4 days	6
50 F	Fever, headache, cough	45 min/day for 3 days	7
40 F	Fever, chest pain, cough, dyspnea, weakness	2 hr/day for 10 days	12
67 F	Fever, headache, runny nose, loss of smell and taste sensation	2 hr/day for 11 days	10
41 F	Fever, dyspnea, sore throat, body pain	½- 1hr/day for 9 days	13
57 M	Fever, weakness	1hr/day for 3 days	5
85 F	Fever, body pain	40 min/day for 3 days	6
88 M	Fever	40 min/day for 3 days	4
35 M	Fever, headache, body pain, weakness	40 min/day for 2 days	7
55 F	Fever, dyspnea, weakness	3-4 hr /day for 3 days	6
65 F	Dyspnea required oxygen supply	40 min/day for 3 days	10
43 M	Dyspnea required oxygen supply	½ hr/day for 3 days	9
61 F	Cough, dyspnea, loss of smell and taste sensation, weakness	20 min/day for 7 days	12

*They were implementing prophylactic earthing. Mean: 8 Days

Table 2. The outcome of nine patients with risk factors after application of earthing.

Age	Sex	Symptoms and signs (Risk factors)	Earthig Duration	Outcome
56	M	Dyspnea, (severe illness, blood Oxygen 38%, Lung CT-scan involvement > 70%)	3 hr./day	On 2nd day, dyspnea improved, blood Oxygen increased up to 95%
67	M	Fever, body pain, anorexia, loss of smell and taste sensations (Diabetes mellitus)	2 hr./day	On 2nd day, fever settlement, recovery of smell and taste sensations, and appetite improvement
32	F	Fever (asthmatic on prednisolone maintenance 10 mg /day)	½ hr./day	Immediate fever reduction after earthing, complete recovery within five days
85	F	Fever, headache, (old age)	40 min./day	Recovery from all symptoms after six days
88	M	Fever and weakness (old age)	40 min./day	Recovery after four days
75	F	Fever, headache, runny nose, loss of smell and taste (diabetes, hypertension, old age)	1 hr./day	Improve all symptoms after three days except intermittent mild fever.
68	M	Five days of high fever, weakness, body pain (severe illness)	1 hr./day	Fever subside after one session earthing
65	F	Fever, dyspnea, cough, required hospitalization (severe illness required continuous Oxygen supply)	40 min/day	Reduced oxygen supply into intermittent one after one session earthing
43	M	Dyspnea, cough, fever (severe illness required intermittent Oxygen supply and hospitalization)	½ hr./day	Improved after three days that Oxygen supply was not required any more