

## CASE SERIES

# Grounding Patients With Hypertension Improves Blood Pressure: A Case History Series Study

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### ABSTRACT

**Background** • Research conducted during the last 15 y has demonstrated that grounding (Earthing) the human body to Earth's surface charge generates multiple beneficial physiological effects. Anecdotal reports include lowering of high blood pressure (BP).

**Objective** • To test such reports, a pilot case history series was undertaken with hypertensive patients in a single physician cardiology practice.

**Intervention** • Patients grounded themselves at home for at least 10 h/d for several mo.

**Outcome Measure** • BP was measured at baseline in the clinic, and then, after starting grounding, 3 subsequent times in the clinic again at approximately monthly

intervals. Patients were also given a BP monitor and were asked to measure their BP on Mondays, Thursdays, and Saturdays at 8:00 AM and 8:00 PM for 12 wk.

**Results** • All 10 patient measurements were found to be significantly improved at the end of the trial period, and some, well before the end. Systolic levels decreased during this time, ranging individually from 8.6% to 22.7%, with an average decrease of 14.3%.

**Conclusion** • This is the first known study measuring the influence of grounding the body on hypertension. The results indicate that grounding appears to be a safe BP-reducing therapy warranting further research. (*Altern Ther Health Med*. 2018;24(6):46-50.)

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### INTRODUCTION

Grounding (also known as Earthing) involves walking, standing, or sitting barefoot outdoors and swimming in the ocean. Grounding can also be conveniently done indoors while sleeping, working, or relaxing in contact with specially conductive sheets, mats, body bands, and electrode patches connected to the ground/Earth of a power outlet or to a ground rod placed in the soil adjacent to a house or office.

These practices ground the body; that is, they equalize it with Earth's surface potential. Multiple reported benefits include improved sleep and mood, decreased pain, a normalizing effect on cortisol, reduction of stress, diminished damage to muscles caused by exercise, lessening of primary indicators of osteoporosis, better glucose regulation, and

immune response. Reviews of documented research results were published in 2012, 2015, and 2017.<sup>1,2,3,4</sup>

Throughout virtually all of history, physical contact with Earth was an ordinary element of life: being barefoot outdoors, living on earthen floors, or using animal hides for footwear and bedding that become conductive because of bodily perspiration and/or moisture in the ground. In the past, such routine contact has served as a conduit for Earth's negative charge to be transferred into the bioelectrically conductive body. This primordial connection has been largely eliminated by lifestyle with time. For many decades now, for example, humans have worn insulating footwear made from plastics and rubber. Most humans no longer live directly on the ground, and often many stories above it.

Earth's surface charge is the product of a virtually limitless storehouse of free electrons constantly replenished by the global atmospheric electrical circuit.<sup>5,6</sup> The grounding hypothesis states that direct contact with the planetary surface charge naturally prevents a buildup of electric charges in the body<sup>7,8</sup> and promotes a systemic normalization of physiologic functioning.<sup>1,2,3,4</sup>

The hypothesis further postulates that the disconnection from ground in modern times has made humans more vulnerable to inflammation, regarded as the cause of common

chronic noncommunicable diseases, such as cardiovascular disease, cancer, diabetes, and autoimmune disorders, which have proliferated in the modern era.

Since the publication of a book on Earthing (2010, 2014),<sup>9</sup> the Earthing Institute, an informational Web site that posts grounding studies, has received unsolicited comments from people about improved blood pressure (BP) after they start grounding. Some individuals have reported that their doctors have been able to reduce medication dosage.<sup>10</sup>

Such reports inspired the present clinical case history series study, the first-ever study conducted to measure a possible influence of grounding on high BP, and explore the utility of adding this concept to current strategies of medication and lifestyle alterations (eg, diet, meditation, and exercise). To conduct this study, interested patients with hypertension would use provided grounding products at home in the course of a several-month period.

## PATIENTS AND METHODS

### Patient Selection

This clinical study was approved by Biomed IRB of San Diego (CA, USA). Participants were patients of HKE, an integrative cardiologist who uses combinations of conventional and alternative strategies in his Southern California practice. All subjects had been diagnosed as hypertensive; some were on medications, and others were not. The author initially approached patients during office visits to ascertain interest in participating in the grounding study. Patients were told of anecdotal reports that grounding may lower BP. Many patients in the author's practice have expressed preference for pursuing nonpharmacologic strategies for their conditions.

### Study Protocol

Interested individuals were referred to AW, who served as nurse coordinator and conducted intake and exit processing that included filling out a health history questionnaire. AW also measured BP and vital signs.

Twelve patients were originally identified. Two were eliminated, one of them because of lack of compliance, and the other because of involvement in a conflicting antihypertensive treatment program.

Participants' BP was measured prior to study (initial visit). The participants returned to author's office for 3 follow-up visits during approximately a 3- or 4-month period for a total of 4 visits (1 prior to grounding, 3 after starting grounding). Both the author (HKE) and a medical assistant monitored participants' BP during first 3 visits. A final visit reading was done by either HKE or AW, or both. The patient was not grounded at the time of the office visits. During the last visit, participants filled out a questionnaire reporting any subjective experiences related to grounding.

### Grounding Materials and Usage

All participants were provided with a grounding half-sheet and mat and instructed how to use them at home. The stipulation was to use both in any combination adding up to

10 to 12 hours each day, the major portion of which typically would be derived from the grounding sheet in bed during sleep. The sheet was to be placed across the width of the bed at the foot end, above the regular bottom sheet, so that the participant's skin (feet, calves, thighs) would come in direct contact with the sheet. The grounding sheet contained a grid of conductive silver fibers throughout the cotton fabric. One end of a 40-foot (12 m) grounding cord snaps onto the sheet's conductive grid. The other end was run outside, under a window, and attached to a 12-inch (30.5 cm) stainless steel ground rod inserted into an area of soil where plants were growing. Participants were instructed to use the mat on the floor, with bare feet placed on it while at the computer, reading, or watching television, or on a chair with the mat in contact with the bare skin of the legs. The mat is made of a leatherette material composed of a dense inlay of carbon particles that provides conductivity. The mat was plugged into the ground port (third hole) of a home electrical outlet checked with a simple outlet checker by the participant to have a proper ground. Participants were also given a home-use BP monitor (HoMedics Automatic BP Monitor, Commerce Township, MI, USA) and instructed in its use. They kept a log of twice-daily BP readings (AM and PM, 12 hours apart) 3 days per week, to supplement in-office readings for several months. The same home monitor cuff was brought to the office and used to obtain readings in the office.

## RESULTS

**Patient 1:** AK, 63-y-old female, a cardiac nurse with history of hypercholesterolemia, hypertension, and hypothyroidism, and family history of cardiovascular heart disease. Patient taking synthroid:

- 50 mcg, QD, aspirin (81 mg QD)
- Initial visit: 05/01/2014: 140/70
- Second visit: 05/30/2014: 140/70
- Third visit: 06/30/2014: 118/90
- Final visit: 07/26/2014: 124/76
- Systolic change from first to last office visit: 11.4% decrease.

**Comment:** Patient, a nurse, had been experiencing frequent BP spikes to 160. Her general practitioner had recommended antihypertensive medication. Grounding successfully controlled her BP without additional medication.

**Patient 2:** JL, 64-y-old female, with history of anticardiolipin/antiphospholipid syndrome (coagulopathy caused by autoimmune disorder) and pulmonary embolism (2010). Hypertension developed 2013. Patient taking Xarelto (20 mg QD), metropole (25 mg, BID):

- Initial visit: 09/11/2013: 145/80
- Second visit: 10/31/2013: 94/70
- Third visit: 11/27/2013: 115/79
- Final visit: 12/30/2013: 115/67
- Systolic change from first to last office visit: 20.7% decrease.

**Comment:** Patient had dramatic response. By third week of grounding, systolic level had dropped into the 106 to 115 range and remained at that level. Diastolic dropped and held steady as well. No change in medication.

**Patient 3:** TG, 57-y-old female, with history of mitral valve prolapse and multiple musculoskeletal injuries, and significant family history of CHD and hypertension. She is a pain management patient who developed hypertension in menopause. Her pain physician recommended anti-hypertension medication. She was reluctant.

- Initial visit: 03/1/2013: 145/100
- Second visit: 04/8/2013: 118/82
- Third visit: 05/6/2013: 116/72
- Final visit: 08/8/2013: 124/70
- Systolic change from first to last office visit: 14.5% decrease.

**Comment:** Patient responded well to grounding. Her BP went down significantly and rapidly, as documented in her home log. She has continued to maintain a healthy BP following the study.

**Patient 4:** JTB, 67-y-old male, with mild hypertension and borderline diabetes. No medication.

- Initial visit: 02/28/2013: 140/80
- Second visit: 03/29/2013: 124/70
- Third visit: 04/29/2013: 124/70
- Final visit: 06/3/2013: 123/80
- Systolic change from first to last office visit: 12.1% decrease.

**Comment:** Patient's BP had been around 140/80 approximately 2 years. Prior to grounding study, medication was being considered. At an office visit on 8/22/2013, his reading was 130/70. Patient was still grounding more than 4 years later with similar stable readings and still taking no medication.

**Patient 5:** RM, 74-y-old male, with history of hypercholesterolemia, CHD, stent placement, and wide fluctuations in BP. Not well controlled on several medications when first seen: Atenolol (50 mg, QD), Amlodipine (10 mg, QD), Benzapril (40 mg, QD). Plus also taking Lipitor (20 mg QD) for high cholesterol). Initial visit 9/2/2015: 152/60

- Second visit: 10/21/15: 120/70
- Third visit: 11/11/15: 130/70
- Final visit: 2/2/2016: 130/70
- Systolic change from first to last office visit: 14.5% decrease.

**Comment:** This cardiac patient reported frequent PM BP spikes to 150/80. Atenolol decreased in half to 25 mg, QD. Approximately 6 weeks after initial visit and starting grounding, office BP measured at 120/70. Within few weeks, BP spikes had ceased and BP came under control with less

medication. On 11/11/15, atenolol discontinued and Amlodipine decreased from 10 mg, QD, to 5 mg, QD. At visit in February 2016, office visit BP was 130/70.

**Patient 6:** CH, 71-y-old male, with fatigue, hyperlipidemia, and poorly controlled hypertension. Taking 3 medications for BP: metoprolol (100 mg, QD), losartan (100 mg, QD), and amlodipine (5 mg, QD). Also taking Lipitor (20 mg, QD). Initial visit 5/6/2016: 150/70

- Second visit: 06/24/2016: 136/61
- Third visit: 07/20/2016: 158/74
- Final visit: 08/11/2016: 116/56
- Systolic change from first to last office visit: 22.7% decrease.

**Comment:** Regimen streamlined at start. Metoprolol decreased to 50 mg, QD. Edarbi, 80 mg, QD, substituted for both losartan and amlodipine. Patient reported better BP control and less fatigue. In October 2016, patient seen in office and was still grounding. BP being maintained at 130/70.

**Patient 7:** MD, 41-y-old male, with history of extensive gastrointestinal surgery (unsuccessful, according to patient), hand surgery, opiate addiction, and mild hypertension. Patient not taking medication and wanted to avoid medication if possible.

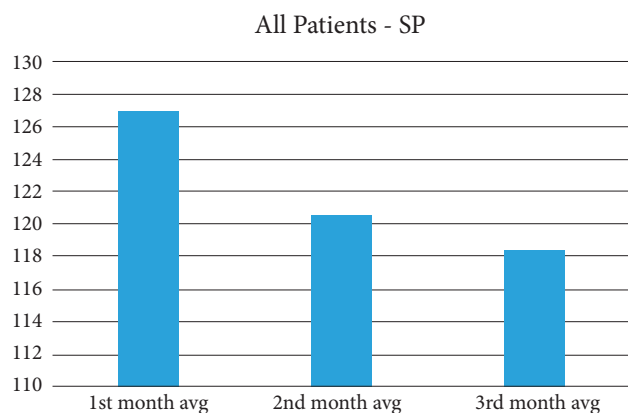
- Initial visit: 04/27/2016: 148/80
- Second visit: 07/1/2016: 126/86
- Third visit: 07/21/2016: 118/72
- Final visit: 09/22/2016: 128/80
- Systolic change from first to last office visit: 13.5% decrease.

**Comment:** After initial visit, patient returned to office on 5/27/2016 for echocardiogram. EKG indicated borderline left ventricular hypertrophy (LVH) and that hypertension was affecting his heart. BP reading was 138/92; however, he was only using the grounding sheet at night. After adding the grounding mat, for additional grounding hours during the day, patient had subsequent office measurements of 126/86 and 128/80. Patient remarked was sleeping better and remembering dreams much more vividly.

**Patient 8:** RP, 66-y-old female, with history of hyperlipidemia and hypothyroidism, and family history of cardiovascular disease. Before entering study, patient had embarked on wellness program with exercise and diet, and had lost about 50 pounds. She was taking no medication, and wanted to avoid medication altogether.

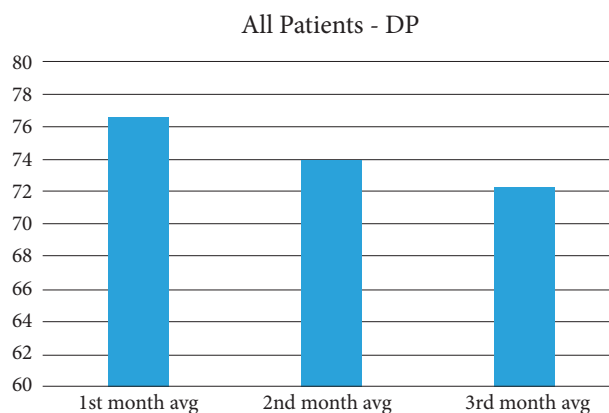
- Initial visit: 06/8/2016: 150/70.
- Second visit: 08/1/2016: 127/82
- Third visit: 08/29/2016: 128/72
- Final visit: 10/23/2016: 132/74
- Systolic change from first to last office visit: 12% decrease.

**Figure 1.** Combined Average Systolic BP, as Recorded at Home by Patients



Abbreviation: BP, blood pressure.

**Figure 2.** Combined Average Diastolic BP, as Recorded at Home by Patients



Abbreviation: BP, blood pressure.

**Comment:** Patient underwent echocardiogram on 7/15/2016 with normal size and thickness of LV, normal systolic function but abnormal diastolic function. Patient's BP logs at home showed significant BP improvement, but readings in office remained high on two occasions during the trial, but were lower when retested 20 to 30 minutes later. One office visit peaked at 160/80, while home systolic readings remained mostly around 120 or below, and 140 the highest. The diastolic level remained stable at 60 to 70.

**Patient 9:** AM, 63-y-old female, history of mixed connective tissue disorder, experienced increase in BP over previous year, reaching the 140/60 range, and spikes to 160, which frightened her. Taking Plaquenil (200 mg, QD). Patient is clearly hypertensive and hoped she would not require medication.

- Initial visit: 05/10/17: 140/80
- Second visit: 06/26/2017: 128/72
- Third visit: 07/24/2017: 117/70
- Final visit: 08/31/2017: 128/62
- Systolic change from first to last office visit: 8.6% decrease.

**Comment:** On 6/12/2017, approximately 2 weeks after starting grounding, BP during an office visit was 130/70. On 7/28/2017, she came to office for an echocardiogram. Her BP measured 120/60. The echocardiogram indicated mild concentric left ventricular hypertrophy and diastolic dysfunction, associated with hypertensive heart disease. She was at risk for progression. On 8/6/2017, patient's car was rear-ended and she suffered a minor neck injury and concussion. Her blood remained excellent without medication.

**Patient 10:** KH, 66-y-old female, with a history of migraines, and intermittent episodes of palpitations, dizziness, anxiety, panic attacks, and hypertension, with repeated emergency room visits. Systolic rises to 160 when

becomes highly anxious. Husband takes patient's BP, reporting an average of 140/85.

- Initial visit: 03/30/2017: 143/79
- Second visit: 05/1/2017: 132/83
- Third visit: 05/29/2017: 146/85
- Final visit: 07/6/2017: 124/68
- Systolic change from first to last office visit: 13.3% decrease.

**Comment:** Patient first seen in October 2016 after hypertension episode and visit to ER. In December 2016, BP in office had measured 130/60. In February 2017, echocardiogram was unremarkable. After starting grounding, patient reported sleeping better and that her children say she is more relaxed.

As a supplement to the periodic clinic measurements, participating patients measured their own BP 6 times per week, for a total of approximately 76 times, as mentioned earlier. Figure 1 charts the average systolic BP for the group during the trial period. Figure 2 shows the average diastolic BP readings. For both average systolic and diastolic BPs, statistical comparisons using *t* test showed progressive improvement: third month significantly lower than the second ( $P < .01$ ), and second significantly lower than the first ( $P < .01$ ).

## DISCUSSION

In this study, BP improvements were measured, compared with baseline, for 3 to 4 months in all 10 study participants grounded at home for at least 10 hours daily. Participants were male and female patients of different ages with different degrees of hypertension. Some had heart disease. Some were following specific diets, some were on exercise routines, none of which had been prescribed by HKE. All were having some difficulty with BP control.

Grounding has been shown to influence the physiology in many ways.<sup>1,2,3,4,9</sup> The potential to improve BP is thought to come from several different mechanisms:

1. Improvement in autonomic/parasympathetic function.<sup>11,12,13,14</sup>
2. Normalizing effect on cortisol.<sup>14</sup>
3. Reduction of inflammation and pain.<sup>3,15</sup>
4. Better sleep.<sup>14</sup>
5. Improved blood flow and viscosity.<sup>15</sup>

All of these factors, and likely others as well, may combine to benefit BP. During final office visit, participants were asked whether they noticed any changes in their quality of life after starting grounding. Feedback included 1 or more of the following common benefits of grounding: better sleep, more calmness, and less aches and pains. None of the participants reported adverse effects.

It is important to note that grounding generates a blood thinning effect.<sup>15</sup> Thus, for patients taking blood thinning medication, extra precaution and monitoring is warranted if grounding is being considered.

The sample size of the study is too limited to say whether regular grounding may allow avoidance of medication, as some patients in the study desired, or for reduced dosage when patients already take medication. What this study suggests is that grounding may make such considerations possible.

## CONCLUSION

For the first time, a study has been undertaken to ascertain the effect of grounding the human body on hypertension. Ten patients with hypertension participated in a case history series study and were documented to have significantly improved BP measurements after grounding themselves daily for at least 10 hours in the course of a several-month period. Participants subjectively reported better sleep and less pain. The results of this analysis, in a small patient sampling, clearly shows that grounding could represent a safe, simple, and effective lifestyle strategy for reducing BP in patients with mild to moderate hypertension who wish to avoid pharmaceutical drugs. A larger study is warranted.

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## AUTHOR DISCLOSURE STATEMENT

The authors have nothing to disclose.

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