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A Study of Benefits in His Circulatory System to A Blood Pressure Patient by Walking with Bare Feet on 2 Hours Daily Grass Surface

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Abstract

A study examining the effects of walking barefoot on grass for two hours daily in a blood pressure patient could reveal several potential benefits for the circulatory system. This practice may enhance circulation through increased foot and leg muscle engagement, promote relaxation and reduce stress levels which positively impacts blood pressure, and provide grounding effects that help to stabilize the body's electrical fields. Moreover, walking on natural surfaces can encourage a more natural gait, improve balance and proprioception, and potentially lead to an improved overall cardiovascular health by fostering regular physical activity and connecting with nature. However, individual results can vary and should be considered in conjunction with medical advice.

Keyword: Bare feet, Blood Pressure, Circulatory System, bare feet, Nature & blood pressure Patient.

Introduction

It is widely acknowledged that spending time in natural environments is beneficial for one's well-being. Numerous studies have shown that individuals residing near green spaces—such as parks, greenbelts, tree-lined avenues, and rural areas—experience improved physical and mental health. Additionally, practices like Indian forest bathing and Nordic hygge, which emphasize outdoor experiences, are gaining popularity in the natural plane & himalayan areas. Could grounding be the next trend?

Recently, a colleague suggested that a mutual patient—who I was advising on nutrition while she was focusing on stress & Blood Pressure management—try **walking barefoot on grass** for a brief period each day. A few weeks later, I came across an article that identified this practice as grounding. The concept of grounding, or earthing, posits that humans have evolved in direct contact with the Earth's subtle electric charge, a connection that has diminished due to modern inventions such as buildings, furniture, and shoes with insulated synthetic soles.

Proponents of grounding suggest that this disconnection may be a factor in the chronic illnesses that are especially common in industrialized nations. There is scientific evidence to support this claim. Studies indicate that direct contact with the earth while barefoot can lead to immediate improvements in various physiological indicators, aiding in better sleep, maintains Blood Pressure, alleviating pain, reducing muscle tension, and lowering stress levels.

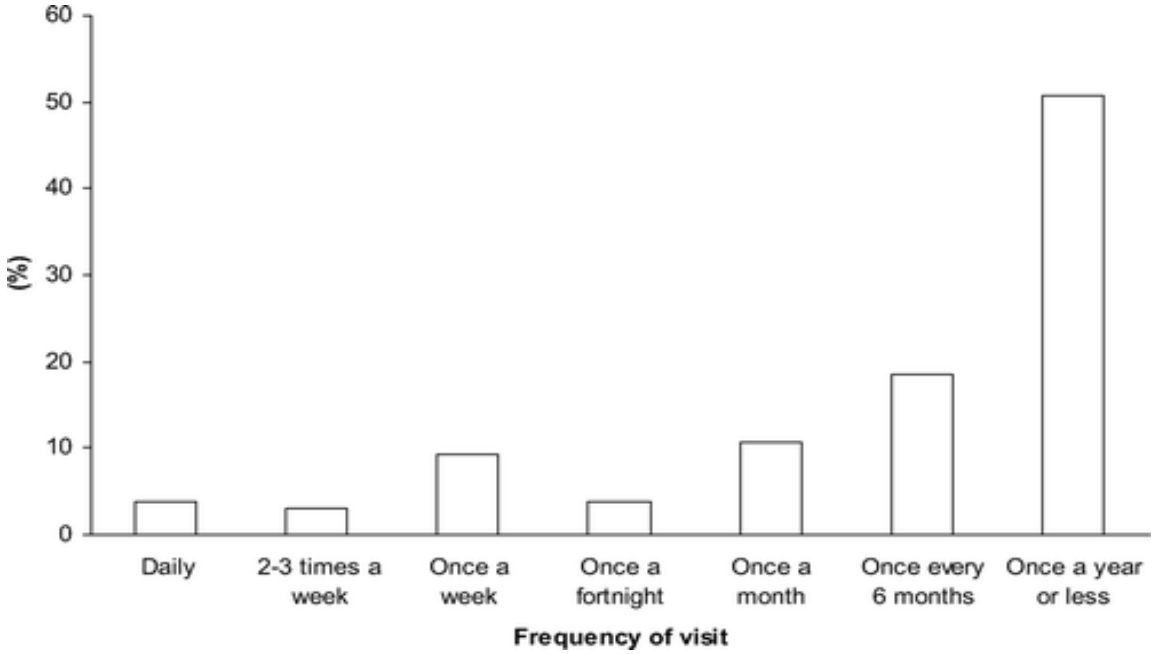

Fig- 1: Benefits of daily barefoot walking on the grass field

Nervous system and the Circadian Rhythms

Research indicates that direct physical interaction with the Earth's surface may play a significant role in regulating the autonomic nervous system and maintaining the synchronization of circadian rhythms, which are essential for managing various physiological processes such as body temperature, hormone release, digestion, and blood pressure in accordance with the day/night cycle. Disruption of these internal biological clocks has been associated with numerous health issues, particularly highlighted in studies involving shift workers. A crucial factor in this process may be the influence on the vagus nerve, the principal nerve of the autonomic nervous system that extends from the brain to the colon, and is integral to the functioning of the heart, lungs, and digestive system. A robust vagal tone facilitates quicker relaxation following stress, whereas a diminished vagal tone is linked to chronic inflammation. This inflammation is, in turn, connected to various chronic health conditions, including cardiovascular diseases, type 2- diabetes, and certain cancers. Vagal tone is typically evaluated by analyzing heart rate variability during inhalation and exhalation. Notably, one study demonstrated that grounding techniques enhanced heart rate variability and vagal tone in preterm infants; while another small-scale study involving adults found that a two-hour grounding session led to reduced inflammation and improved blood circulation.

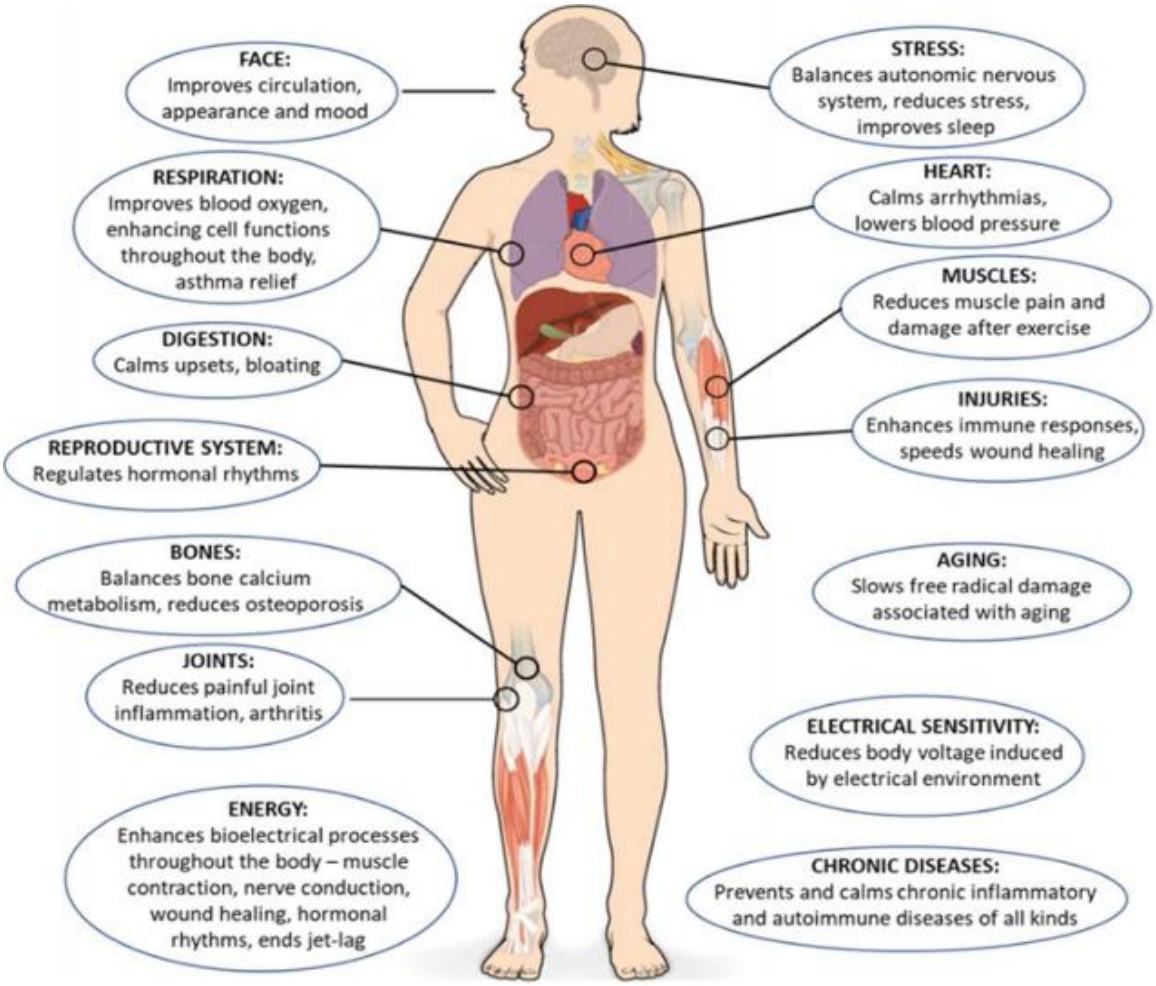

Fig- 2: Effects of walking barefoot on our body

Statistical Methodology

The current research was carried out at Vidyant Hindu P.G. College in Lucknow, under the Department of Physical Education, with the institution's research approval. This cross-sectional study involved first-year B.A. students (N = 56), selected through purposive sampling. Participation was completely voluntary, and the study was conducted without interfering with their academic commitments. Each participant provided written informed consent after a thorough explanation of the study's objectives and procedures. Demographic data were gathered from all participants. Following a five-minute rest in a supine position, blood pressure (B.P.) was measured twice for each student, with a five-minute interval between readings. A mercury sphygmomanometer (Nilkhant, Industrial Electronic and Allied Products, Lucknow) was used for the measurements. Systolic blood pressure (S.B.P.) and diastolic blood pressure (D.B.P.) were determined by observing the appearance and disappearance of Korotkoff sounds, respectively. The mean blood pressure (M.B.P.) was calculated using the formula M.B.P. = D.B.P. + 1/3 Pulse Pressure. To minimize bias, all B.P. measurements were conducted by the same observer. The study included all pre-hypertensive subjects (N = 56) with S.B.P. readings between 120-140 mmHg and D.B.P. readings between 80-89 mmHg after screening. Participants with a known history of hypertension, kidney disease, diabetes mellitus, other endocrine disorders, psychiatric illnesses, a B.M.I. over 30, recent smoking (within 2 Hs), alcohol consumption (within 12 hours), or those on medications affecting B.P. were excluded. Participants were randomly divided into two groups: a study group (N =

27) and a control group (N = 29), based on whether they had barefoot contact. Members of the study group removed their sports shoes or slippers and remained barefoot for one hour, ensuring both feet were in indirect contact with the ground, while the control group kept their footwear on. All participants were seated comfortably during the study.

Data Analysis

Table-1:- Comparison of Systolic blood pressure, diastolic blood pressure and mean blood pressure in Study group before and after a 2 hour of barefoot earth contac

Parameters	Study group (N = 27)		'P' value
	Before observation (Mean ± S.D. in mmHg)	After observation (Mean ± S.D. in mmHg)	
Systolic blood pressure	134.37±11.02	122.81±7.98	0.0002*
diastolic blood pressure	81.22±8.95	73.56±8.03	0.0015*
mean blood pressure	98.94±8.59	89.94±6.77	0.0001*

Table -2:- Comparison of Systolic blood pressure, diastolic blood pressure and mean blood pressure in control group before and after a 2 hour of observation (without barefoot Earth contact)

Parameters	Control group (N = 29)		'P' value
	Before observation (Mean ± S.D. in mmHg)	After observation (Mean ± S.D. in mmHg)	
Systolic blood pressure	131.93±9.15	128.60±7.19	0.1300
Diastolic blood pressure	76.09±11.63	78.32±7.31	0.4193
Mean blood pressure	94.68±9.71	95.01±6.37	0.8912

Research Result

In this study, all pre hypertensive subjects of the study group had higher mean values of Systolic blood pressure, Diastolic blood pressure and Mean blood pressure at rest, which were reduced to lower levels after an hour of barefoot contact with the ground. In the control group, excepting a small, insignificant fall in Systolic blood pressure, there was no change in Diastolic blood pressure and Mean blood pressure after an hour of rest. The decreased Systolic blood pressure seen in both the groups could be due to physical rest for an hour. This indicates that the greater reduction in BP of the study group might be due to barefoot contact with the earth because all other factors influencing blood pressure were similar for both the groups. Sympathetic nerves to the heart and blood vessels control cardiac output and peripheral resistance, whereas parasympathetic nerves mainly control heart rate. Therefore, derangement of autonomic nervous system activity either increased sympathetic or decreased parasympathetic activity causes an elevation of blood pressure. Considering the role of autonomic nervous system in short-term regulation of blood pressure, we determine that the reduction seen in blood pressure of majority of pre hypertensive's after having barefoot contact with the ground for one hour duration can be attributed to the modulator effect of earth on autonomic nervous system. Limitations of the study: Firstly, it was a very short duration experimental study, i.e. one hour barefoot contact on pre hypertension. So, we aren't

sure whether a short period of direct barefoot contact with the earth can reduce blood pressure in such cases also, if yes, then to what extent.

Summary of Research

Initially, this study aimed to investigate whether direct barefoot contact with the earth has the potential to alter the activity of the autonomic nervous system. The findings suggest that such contact can indeed affect autonomic nervous system function, as demonstrated by a reduction in elevated blood pressure levels. Should future clinical trials confirm the positive impact of barefoot contact on hypertension, it may be beneficial for individuals to go barefoot whenever possible, enhancing physiological functions, preventing hypertension, and promoting overall health for humanity.

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