Journal of Research in Medical and Dental Science
2020, Volume 8, Issue 4, Page No: 130-135

Available Online at: www.jrmds.in
eISSN No. 2347-2367: pISSN No. 2347-2545

The Effect of Acupuncture and Foot Reflexotherapy on Palmar Hyperhidrosis in a Young girl: A Case Report

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ABSTRACT

Introduction: Palmar hyperhidrosis is the excessive and unpredictable sweating on the palms, which results in severe distress in occupational and social life of the sufferer. Pharmacological and surgical interventions, which are the mainstay of treatment, are invasive or associated with multiple side effects. Furthermore, efficacy of therapy is not guaranteed. Alternative techniques may have positive effects on palmar hyperhidrosis. However, there is severe lack of data on the application alternative therapy on palmar hyperhidrosis. The aim of this study was to investigate the effects of acupuncture and foot reflexotherapy in a young girl with palmar hyperhidrosis.

Case: The subject of the present study was a 19-year female University student diagnosed with palmar hyperhidrosis. She was treated with acupuncture and foot reflexotherapy 4 times, once each week (i.e. 4 weeks of treatment sessions). Palmar sweating significantly improved with therapy and by the fifth-sixth week from treatment onset, the patient reported no palmar perspiration.

Conclusion: Acupuncture and foot reflexotherapy may be safe and effective alternative therapeutic techniques that can decrease the intensity of sweating in palmar hyperhidrosis to acceptable degree.

Key words: Palmar hyperhidrosis, Acupuncture, Foot reflexotherapy

HOW TO CITE THIS ARTICLE: Menizibeya O Welcome, Senol Dane, The Effect of Acupuncture and Foot Reflexotherapy on Palmar Hyperhidrosis in a Young girl: A Case Report, J Res Med Dent Sci, 2020, 8 (4):130-135.

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Received: 01/07/2020

Accepted: 20/07/2020

INTRODUCTION

Palmar hyperhidrosis is defined as excessive and unpredictable perspiration on the palms, which results in severe distress and discomfort in daily life, causing dramatic impairment in occupational and social activities [1]. It is chronic, usually occurring during rest, and is unrelated to the need of heat loss from the body. However, symptoms worsen during conditions of stress, anxiety or nervousness [2]. Estimates indicate that about 1-3% of the general population suffer from the condition, which usually starts at the adolescent period, especially 13-19 years of age [1]. The etio-pathogenic mechanisms are not completely understood, but available evidences suggest that localized sympathetic hyperactivity triggered by stressful events may play a role [3]. There is also no known histopathological abnormality of sweat glands or autonomic nervous system associated with palmar hyperhidrosis [2]. Pharmacological or surgical intervention is the mainstay of treatment but is invasive and associated with multiple adverse effects [3-7]. Furthermore, efficacy is not guaranteed [3]. For example, transthoracic endoscopic sympathectomy, which is the current surgical approach reported to decrease palmar hyperhidrosis [8, 9]. However, this surgical treatment is marred with compensatory hyperhidrosis on the trunk and thighs [10]. Consequently, avoidance of the complications of compensatory hyperhidrosis is one of the main goals in the treatment of palmar hyperhidrosis. Unfortunately, however, no surgical therapy has successfully resolved this problem.

Numerous reports indicate the therapeutic effectiveness of reflexology [10–13]. Reflexotherapy is a traditional and complementary massage therapy in which deep massage is applied by therapist's hands to

specific areas representing various organs on the ears, hands, and feet [14]. In reflexotherapy these specific points or areas on ears, hands and feet are accepted as projections of the different organs or tissues of the body. Foot reflexotherapy is the most widely used in reflexology [15]. It has been asserted that reflex arcs related to the different organs and tissues begin from specific small areas on the foot in foot reflexotherapy. Studies have shown that foot reflexotherapy play an important role in relieving psychological stress in patients with various health problems [16-18]. Acupuncture on the other hand involves the stimulation of specific points on the body by inserting thin needles through the skin. The acupoints are believed to be projections of internal organs of the body. The insertion of the acupuncture needles at the desired point that represents projection of the internal organ or function to be stimulated causes a change in the physical functions of the body. Acupuncture has been used to treat or reduce the symptoms of several diseases, including pain and psychological illnesses [3].

Alternative techniques may have positive effects on palmar hyperhidrosis. However, there is severe lack of data on the application alternative therapy on palmar hyperhydrosis. The aim of this study was to investigate the efficacy of acupuncture and foot reflexotherapy on an adolescent girl with palmar hyperhidrosis.

CASE AND METHOD

The case was 19 years old female university student who presented in April 2019 with complaints of excessive sweating on the palm. The condition was noticed about 10 years ago. The girl has intermittently visited the hospital for her condition over the past 6 years, but there was no improvement. According to her, the condition made it difficult for to hold pen and write in school as her hands sometimes drip with sweat. The patient says the condition worsens during examination, making it difficult to effectively complete a written examination. She does not suffer from other medical problems. There is a family history with her father reportedly having same excessive sweating, but on the head and palms since adolescent period.

Diagnosis of palmar hyperhidrosis was made according to published criteria [19, 20]. The case was followed to document improvement of palmar sweating after treatment with acupuncture and foot reflexotherapy. To assess palmar sweating, the patient was required to report the following categories of sweating: dry, slightly damp, and wet. “Dry” indicated no sweating and was defined as palm that is completely without sweat in any situation. “Slightly damp” indicates some degrees of sweating, defined as somewhat damp palm under elevated environmental temperature or anxiety, in the absence of any visible sweat, and not associated with discomfort. “Wet” indicated sweating, defined as overt sweating that is associated with patient’s discomfort. Both palms of the girl were evaluated separately in course of follow-up. Furthermore, we administered a 4-point Hyperhidrosis Disease Severity Scale (HDSS) for self-assessment of sweating severity (Table 1) [21]. The heart rate and blood pressure were also determined before and after therapy according to well recognized principles of measurement [22].

Reflexology was performed according to previous recommendations with modifications [23, 24]. Briefly, the girl was duly informed about the procedures of foot reflexology/acupuncture and the sensations of needle prickling as well as response sought. She was allowed to relax comfortably while sited in an armchair for 20 minutes before commencement of therapy. Foot reflexotherapy was first applied to the left foot, and then to the right foot for duration of 10 minutes for each foot (i.e. 20 minutes altogether) for each treatment session in the afternoon between 4.00 and 5.00 pm. First, massage cream was applied to the foot to reduce friction between the practitioner’s fingers and the dorsal surface of the big toe of both feet (Fig. 1). The massage was

Table 1: Hyperhydrosis disease severity scale (HDSS) [21].

Score	Description
1	Never noticeable and never interferes with my daily activities
2	Tolerable but sometimes interferes with my daily activities
3	Barely tolerable and frequently interferes with my daily activities
4	Intolerable and always interferes with my daily activities

Figure 1: Brain reflex zone on the foot. Stimulation of this zone by gentle massage activates the sensory receptors that mediate information transmission centripetally to specific regions of the brain via the spinal cord. Stimulation of the cortical zone in turn improves connectivity of sensorimotor network in multiple brain regions, and also, enhances connectivity between cortical and subcortical structures, thereby increasing the speed of information processing and improving the functions of peripheral tissues and organs including the sweat organs [24,25].

done through application of moderate pressure aimed at muscle relaxation by manipulating the soft tissues of the dorsal surface of the big toe of both feet with gentle touching, gliding, stroking and kneading maneuvers using thumbs and fingers to apply appropriate pressure to reflexology areas, especially the brain projection area in both feet (Figure 1). These areas were the classic foot reflexology therapy areas [24, 25]. The girl received foot reflexotherapy at a time, once per week, for a total of 4 weeks.

Foot reflexotherapy was immediately followed by acupuncture. The style of acupuncture was done according to the Traditional Chinese Medicine. For the acupuncture therapy, HT7 acupuncture points (shen men in Chinese for "spirit gate") in both upper extremities were selected. The HT7 acupoint is situated at the wrist crease, on the radial side of the flexor carpi ulnaris tendon, between the ulna and the pisiform bones. The HT7 point was manually stimulated with a sterile single-use stainless needle, measuring 0.3 mm in diameter and 30 mm in length (Huan Qiu, Suzhou, China). The needle was inserted perpendicularly to the skin and subcutaneous tissue to a depth of approximately 10 mm at the acupoint bilaterally without any stimulation for each session. Altogether, acupuncture needle was placed for 20 minutes. A total of 2 needles were used for each session. The patient was advised to come for treatment every week on same day (Friday), thereby allowing for seven days rest period. This rest period is usually indicated for improvement and adaptation during acupuncture therapy [26, 27]. Treatment was not varied. Therapy was occasionally accompanied by muscle twitch response, but there was no de qi sensation. The patient was not given other treatments. She was also not given any advice with regards to lifestyle changes and food preferences. Both foot reflexology and acupuncture were performed in a designated treatment room by one of the authors (SD) who is institutionally qualified with over 15 years of experience in clinical reflexology and acupuncture.

RESULTS AND DISCUSSION

Palmar sweating substantially improved with therapy and by the fifth-sixth week from treatment onset, the patient reported no palmar perspiration (i.e. dry – indicating absence of palma sweating). The HDSS score was 3 points before therapy, but after the end of therapy period, the score reduced to 1 point. The normalize heart rate and blood pressure measured after therapy ranged from 60 to 76 beats per minute and 100/60 to 110/68 mmHg respectively compared to 90 beats per minute and 120/85 mmHg before commencement of therapy. Therefore, acupuncture and foot reflexotherapy may be safe and effective alternative therapeutic techniques that can be used to substantially decrease the intensity of sweating in palmar hyperhidrosis to a satisfactory level.

Acupressure and reflexotherapy are non-invasive treatment techniques in which pressure is applied to specific body points [28]. However, while we performed reflexotherapy (which may be referred to as a type of acupuncture) on the foot, acupuncture was done only on the specified acupoint on the patient's hands. Indeed, the HT7 is the most prevalent point that is used

in existing acupuncture treatment protocols. The HT7 acupoint is often considered the main acupoint to control and calm the "spirit" [28]. The reflexotherapy zone on the dorsum of the big toe is a classical area for the brain [24, 25]. This zone was chosen because of the integral role of the brain in controlling autonomic activities of peripheral tissues and organs of the body.

Indeed, the effectiveness of foot reflexotherapy has been reported to reduce psychological stress, and normalize heart rate, arterial blood pressure and respiratory rate [29]. Furthermore, reflexology therapy was demonstrated to reduce pain in patients with low back pain [30]. Again, a randomized controlled study conducted by Siev-Ner et al. [31] showed that 11-week feet reflexotherapy and massage of the calf area in patients with multiple sclerosis led to improvement in intensity of paresthesia, urinary symptoms, and muscle strength. In a recent study, foot reflexotherapy reportedly increased EEG waves (beta and gamma oscillations), which is related to memory and attention functions [15]. The effectiveness of foot reflexotherapy has been shown in ADHD – the therapy attenuated inattention and hyperactivity in a child, and also, treated completely enuresis nocturia after 8 weeks of treatment sessions [24]. Accumulating evidences indicate that acupuncture can be used to treat a variety of diseases and conditions, including psychological disorders [3, 32-35]. Importantly, like foot reflexotherapy, acupuncture is well-tolerated with little or no potential adverse health consequences [35]. HT7 acupuncture has been reportedly used to treated sleep disorders [36-39], reduce hot flashes in men with advanced prostate cancer [40], and positively modulate heart rate variability in healthy and non-healthy individuals [41]. Our study is one of the first to report positive effects of HT7 acupuncture and foot reflexotherapy on palmar sweating.

It is speculated that the mechanisms by which foot reflexotherapy [35] and acupuncture [3, 33] affect body functions are due to the mediation of balance between sympathetic and parasympathetic divisions of the autonomic nervous system, and also, stimulation of the release of mediators that act on local and distant sites to regulate physiological processes. Consistent with previous studies [3, 7, 33], Arai et al. (2013) demonstrated that shen men acupuncture at both auricles increased parasympathetic activity [41]. HT7 acupuncture is widely believed to be a region that restores sympathovagal imbalance by stimulating the peripheral receptors that project to the region of the brain that controls the activities of specific tissues and organs of the body. The activated brain regions in turn discharge signals involved in controlling the functions of the associated tissues and organs that ultimately lead to normalization of functions [42]. The stimulatory effect of HT7 acupuncture and foot reflexotherapy may be additive, thereby providing enhanced positive results [37, 42]. Concomitantly with increased parasympathetic activity, these treatment techniques are associated reductions in heart rate and blood pressure [37]. We also observed reduced and normalization of heart rate and blood pressure in our study. Though the mechanisms are not clearly understood, similar to the effects of HT7-acupuncture [39], foot reflexotherapy has been associated with substantial decrease in the level of cortisol and increase in dopamine, serotonin and endorphin levels [37]. However, we did not assess the level of these hormones in our study. The complete disappearance of palmar hyperhidrosis after acupuncture and foot reflexotherapy is an indication of the effectiveness of the therapy. Prior to our study, Martin (2015) reported a case of a 40-year old male in which monotherapy of anxiety-related hyperhidrosis with acupuncture led to significant improvement in subjective evaluated levels of anxiety and stress as well as palmar sweating [3]. The combined therapy probably had an additive effect on parasympathetic activation and reduced stimulation of the autonomic nervous system. The humiliating and uncomfortable sweating on the patient's palms not only significantly improved, but also, disappeared at the end of the therapy and during follow-up [32]. Also, apart from the transient muscle twitch response which occurred only during treatment sessions, the girl did not report any adverse health effects of the therapy.

Many studies have reported that the most complementary medicine applications result in the decrease of psychological stress through decreasing sympathetic activity and increasing parasympathetic activity in the body. For example, it has been reported that wet cupping therapy restored sympatho-vagal imbalances

and decreased psychological stress by decreasing sympathetic activity and increasing parasympathetic activity [43]. In some recent studies, it was reported that foot reflexotherapy [15], footbath therapy [44], and wet cupping therapy increases [45] beta and gamma activities of the brain EEG in young healthy humans. Also, some different complementary approaches were reported to be very useful to decrease pain in some other pain syndromes, for example, foot bathing therapy for surgical pain in women with cesarean section [46], moving dry cupping for upper shoulder and neck pain [47], wet cupping for shoulder pain and neck pain [48] and foot reflexotherapy for acute low back pain [49]. Therefore, it can be suggested that combined acupuncture and foot reflexotherapy can be effectively used to decrease symptoms of palmar hyperhidrosis.

The girl will be followed up for a period of one year to ascertain whether the effects of HT7 acupuncture and foot reflexotherapy were sustained.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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