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A Simple Sustained Solution for Dissolution of the Cellulite

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Abstract The study aimed to demonstrate the influence of the colonic ***Helicobacter pylori*** strains in leading to the pathologic features of cellulite and illustration of the role of combined ***H. pylori*** natural eradication and suction cupping therapy massage in improvement of cellulite. Cellulite refers to a dimpled skin pathology that changes the skin surface appearance into an orange peel morphology. It remains a major cosmetic concern for women as it affects the vast majority of women. Cellulite is manifested by tissue edema and lipodystrophy whereas its etiology includes multiple factors. Cellulite is a frequent skin condition for which treatment remains a challenge, a wide variety of treatments are available but an effective and long-term treatment of cellulite has not been well established, it is still difficult to indicate an effective exclusive single treatment for this condition. Existence of colonic ***H. pylori*** strains was investigated among a group of 30 women with cellulite employing a specific test. Natural measures for eradication of ***H. pylori*** were used for the women with positive colonic ***H. pylori*** strains. Suction cupping therapy massage was done for the treatment of cellulite features. Consistent improvement in the skin texture, skin laxity, body weight, the body mass index, subcutaneous fat and cellulite features was demonstrated in 24 women (80%) within three months of therapy. Another three women (10%) showed the same good improvement in cellulite after further two months. The bacterium ***H. pylori*** colonic strains seem to have a significant role in the development of cellulite during latest decades. Combined senna/vinegar therapy and suction cupping therapy massage could be promising as simple sustained solution for treatment of cellulite among subjects with positive colonic ***H. pylori*** strains.

Keywords Cellulite, Helicobacter pylori, Senna purge, Suction cupping massage, Vinegar

1. Introduction

Cellulite refers to a dimpled skin pathology that changes the skin surface appearance into an orange peel morphology. It is multi-factorial in its etiology caused by subcutaneous fat bulging into the dermis leading to cosmetic disfigurement which could be sometimes typically described as cottage cheese-like. Despite its high prevalence affecting a vast majority of post-pubertal women (85-98%), it remains a major cosmetic concern for women as it constitutes one of the most intolerable aesthetic imperfections [1-4].

Although it is of no danger on general health, cellulite is psycho-socially debilitating. Cellulite is manifested by tissue edema and lipodystrophy while its etiology includes multiple factors. Cellulite and lipodystrophy are often found together especially in the areas of the buttocks and thighs. Edema that accompanies cellulite causes disorders of blood flow; therefore, different preparations and procedures that enhance circulation and improve blood perfusion, peripheral lymphedema and metabolism of subcutaneous fat were introduced to support treatment of cellulite. Cellulite in menopause has raised the attention towards female sex hormones, estrogen and progesterone, as the skin is the target of female sex hormones; the texture and appearance of the skin in women are most significantly affected by female sex hormones. Low estrogen during menopause, being responsible for the increased vascular permeability and decreased vascular tone, would lead to impairment of micro-circulation which is an important factor predisposing to the development of cellulite. Accordingly, preparations containing ingredients which help improving the metabolism of subcutaneous fat and enhance blood and lymphatic circulation in cosmetic styles have been reviewed and recommended in menopause for cellulite treatment [5-9].

An effective and long-term treatment of cellulite has not been well established; it is still difficult to indicate an exclusive and effective single treatment for this condition. Topical treatments, noninvasive energy-based devices and recently developed minimally invasive interventions that may finally provide a solution have been implemented. However, no systematic review has been performed so far in order to evaluate the efficacy of the available treatment options for cellulite [4, 5, 10].

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Slimming creams have been tested for adequate treatment of cellulite without serious adverse effects, however additional large clinical trials are required to confirm their efficacy. Precise effective delivery of laser energy to the dermal adipose tissue as well as the deep adipose lipodystrophy is feasible as a safe measure for simultaneous treatment of cellulite and lipodystrophy in the buttocks and thighs. Intermittent negative pressure devices were initially developed to enhance circulation, improve blood perfusion and combat lymphedema. Focused ultrasonic lipolysis has been reported effective method for reduction of abdominal cellulite with some amount of circumference reduction reversal occurring in long term follow-up. There is growing evidence that extra-corporeal shock wave therapy is able to improve the degree of cellulite. The safety, efficacy and subject satisfaction with vacuum-assisted precise tissue release in the treatment of cellulite among adult women with moderate to severe degree of cellulite had been further reported. Treatment of abdominal cellulite and circumference reduction of abdomen with radiofrequency and dynamic muscle activation demonstrated that radiofrequency provided beneficial effects as regards reduction of abdominal circumference and cellulite appearance while the benefit of muscle activation needed further accurate determination. Radiofrequency had been recommended as painless, safe and effective noninvasive skin tightening measure for body contouring and cellulite reduction. Cryolysis has been introduced as a safe effective noninvasive procedure for body contouring and nonsurgical fat reduction. Clinical evaluations demonstrated consistent improvement in skin texture, laxity and cellulite after cryolipolysis as independently assessed by patients and investigators [2, 3, 6, 8, 11-15].

2. Aim

Demonstration of the frequency of existence of colonic strains of ***Helicobacter pylori*** among a sample of women with cellulite and illustration of the role of these colonic ***H. pylori*** strains in the pathogenesis of cellulite.

3. Design & Settings

A prospective clinical study done in Jeddah/Saudi Arabia between October 2013 and May 2017.

4. Patients & Methods

A group of 30 women with moderate to severe cellulite, variable body weight/body mass index (BMI) and an age range of 34-49 years were included in the study and investigated for the existence of colonic ***H. pylori*** strains employing ***H. pylori*** fecal antigen test [16]. The women who were found positive for colonic ***H. pylori*** strains followed a natural measure for eradication of ***H. pylori*** from the colon which consisted of the senna leaves extract purge colon clear and vinegar therapy. The senna purge was employed every month for three successive times to ensure eradication of the colonic ***H. pylori*** strains while vinegar therapy was used to protect from recurrence of the abnormal-existence/behavior colonic ***H. pylori*** strains via buffering the bacterium ingested with any query meal. Vinegar therapy consisted of a vinegar-mixed salad with principal meals, once or twice daily/five days a week for six months [17]. They had also received suction cupping therapy massage three times every week for one month then twice per week for one month and once a week for one further month [18]. The follow-up of women continued for three years as assessed independently by the women themselves and investigators based on longevity of follow up and observation of the body weight/BMI, subcutaneous fat reduction, skin texture/laxity and improvement of cellulite [15]. Women were not following any particular diet regimen, slimming measures or procedures for cellulite treatment. They were allowed to follow their own style of life except extreme restriction of outside-home meals to avoid recurrence of the colonic ***H. pylori*** strains. Women were advised to watch their colonic condition and repeat the senna purge and vinegar therapy whenever they develop colonic strains of ***H. pylori*** or frank colonic upsets.

5. Results

All women with cellulite were found positive for colonic ***H. pylori*** strains, their weight was ranging between 109-117 KG with BMI ≥25. All women became negative for colonic ***H. pylori*** strains after the senna purge as confirmed by the ***H. pylori*** fecal antigen test. Marked significant slimming was demonstrated in 27 women (90%) within 3-5 months and improvement of their BMI with a range of body weight of 81-92 KG. Slimming was frankly characterized by stretched skin without any redundancy or wrinkles as the loss of weight occurred just gradual [19]. Cellulite markedly improved in 24 women (80%) within three months as independently assessed by the women and investigators based on appearance, laxity and texture of the skin together with disappearance of lumps and dimples. Another three women (10%) showed the same good improvement in cellulite after further two months. Three women (10%) did not complete the study due to travelling from the area while 6 women (20%) gained weight within 18-20 months due to overeating but they did not develop any recurrence of cellulite.

6. Ethical Considerations

An informed signed consent was taken from all women, they were made aware about safety of the natural vinegar therapy and senna extract purge, they were free to quit the

study whenever they like. The research proposal was approved and the study followed the rules of the Research Ethics Committee.

7. Discussion

Cellulite, those lumps and bumps constituting the modern woman's dilemma, seems to be growing in an epidemic way during the latest thirty years. In the past few years the interest of scientists in this problem has clearly increased. Several theories on the patho-physiology of cellulite have been produced. A number of different therapeutic regimens have been developed using modern technology. However, despite the many treatment options for cellulite, patient satisfaction is extremely the most important question as regards this noisy skin condition [1].

Cellulite is a frequent skin condition for which treatment remains a challenge; a wide variety of treatments are available but most procedures offer sub-optimal clinical effect and/or delayed therapeutic outcome. Only few therapeutic options have proven effective in the treatment of cellulite. Despite the growing popularity of noninvasive ultrasonic lipolysis procedures, there is lack of evidence about the efficacy of this method. Long-term follow-up results beyond one year are lacking as well as details on potential combination therapies in cellulite such as with low level laser therapy, cryolipolysis and other procedures [11-13].

An obscure etiology with indefinite cure results for a challenging frequent problem of a recent growing history should direct the clinical attention towards an underlying environmental error. The shortest access to identify an underlying error is to search out for a common reason which is directly related to other medical challenges spreading during the same period.

The latest reports in literature demonstrate a definite flare up of many medical challenges in rather a dramatic way through different reasons. Some reports consider disease spread a consequence of progress and lifestyle change [16, 20-24]. In spite of that, traditional risk rules do not appear fully sufficient to explain the rising figures of chronic illness spread in the world. Prevalence of the phenomena of obesity constituting an actual growing challenge worldwide has been emphasized during the latest few decades [25-28]. The latest three decades confirm the prevalence of abnormal-existence/ behavior colonic ***H. pylori*** strains with flare up of a lot of medical challenges related to these strains through immune, inflammatory, toxic or different unknown reasons [16, 17]. The pathologic influence of these abnormal-existence colonic ***H. pylori*** strains has been demonstrated as concerns the challenge of obesity during the latest three decades [19]; therefore, the influence of these strains in cellulite could be strongly considered.

H. pylori colonized the stomach since an immemorial time as if both the stomach wall and the bacterium used to live together in peace harmless to each other. ***H. pylori*** could migrate or get forced to migrate to the colon under the influence of antibiotic violence to become a foreign structure to the tissues beyond the stomach as the bacterium is recognized only to the gastric wall tissues. ***H. pylori*** outside the stomach is rendered a poison itself by inducing auto-immunity and a source of poison by leading to inflammatory reactions and local tissue pathology. Colonic ***H. pylori*** strains will continue producing ammonia for a reason or no reason, un-opposed or buffered by any acidity, leading to accumulation of profuse toxic amounts of ammonia that could cause different adverse toxic sequels in the body [16, 17]. Different reports in literature have confirmed the association of cytotoxin-associated gene A (cagA) with colonic ***H. pylori*** strains and emphasized that cagA of ***H. pylori*** encodes a highly immunogenic and virulence-associated protein; the presence of this virulent gene in the body could affect the clinical outcome in many patients [29, 30].

Cellulite skin has got characteristic manifestations induced by lipodystrophy and tissue edema leading to the orange peel appearance of the skin with lumps and dimples [1, 6-9]; that is exactly the possible influence of colonic ***H. pylori*** strains on the skin of cellulite. It has been reported that colonic ***H. pylori*** strains interfere with fat turnover, lipid metabolism, lipid-lipoprotein metabolism and glucose metabolism in the body through increasing insulin resistance, these sequels could be sufficient reasons for development of lipodystrophy in the skin of cellulite [19, 31, 32]. Ammonia is a smooth muscle tonic, accumulation of excess amounts of ammonia in the colon could be smooth muscle spastic leading to multiple colonic spasms and a high rectal spasm causing a colonic re-absorptive error with consequent retention of fluids in the body. These fluids, being colonic contents, are expected to include salts and toxins that could induce inflammatory and undesirable pathologic effects [17, 28, 33, 24]. These re-absorbed fluids from the colon are expected to become directed mostly towards the subcutaneous compartment in the lax areas of the body like the buttocks, thighs and abdomen as evidenced by the observational finding that pitting edema over the shaft of the leg among those people appears and increases with colonic troubles while it improves or disappears with improvement of these colonic troubles. This matter could match with the answer of the question; why cellulite selects some areas like the thighs, abdomen and buttocks and spares other areas!! It selects the lax areas where the inflammatory fluids can accumulate; these are at the mean time the same areas of fat deposition which in the presence of the inflammatory fluids could easily go into dystrophy. Accumulation of toxic inflammatory fluids within the subcutaneous tissues is simply sufficient to account for abnormal skin features such as in cellulite. The resulting tissue edema would be responsible for the orange peel appearance of the skin "peau d'orange" with dimpled skin morphology as the skin is normally attached to the dermis by subcutaneous fibrous septa which in presence of edema cause dimples on the surface [2].

The principle of employing the senna extract purge in the current study is to eradicate and ensure eradication of the colonic ***H. pylori*** strains which are the suggested pathogenic reason for development of cellulite. Eradication of ***H. pylori*** from the colon could also help slimming and reduce body fat which is in favor of cellulite improvement [19]. The senna leaves extract purge was demonstrated as the typical natural measure for definitive eradication of ***H. pylori*** from the colon. Three-times dilution of the standard senna leaves extract was found directly lethal to ***H. pylori*** strains on culture media [34-36]. Whereas employment of the vinegar therapy was meant to protect from recurrence of any abnormal-behavior ***H. pylori*** strains via buffering any query food intake. The complex nutritional requirements of ***H. pylori*** are achieved via its unique energy metabolism as the major routes of generation of energy for ***H. pylori*** are acquired via pyruvate while the activity of the pyruvate dehydrogenase complex is controlled by the rules of product inhibition and feedback regulation [37, 38]. As acetate is demonstrated as an end product among the metabolic pathway of ***H. pylori*** [39, 40]; therefore, addition of acetic acid (dietary white vinegar 6%) to the atmosphere around ***H. pylori*** could compromise the energy metabolism of ***H. pylori*** or interfere with the organism's respiratory chain metabolism. So long the matter includes interference with the energy metabolism and respiratory chain metabolism of ***H. pylori***, an immediate dramatic lethal effect on the bacterium could be considered. Twenty times-dilution of dietary white vinegar 6% was found directly lethal to ***H. pylori*** strains upon brief immersion or on different culture media [33, 34]. Accordingly and in the same mechanism, vinegar could interfere with ability of the human body to gain energy from carbohydrates forcing it to consume lipids for gaining energy; therefore, vinegar in this study could participate in slimming purposes also to improve the general state of the skin and cellulite.

The principle of employing the cupping suction massage in this study is enhancement of the circulation, treating tissue edema via encouraging lymphatic drainage and improving the micro-circulation [18]; tissue edema, lack of proper circulation and inadequate micro-circulation are known underlying pathologic elements in leading to cellulite [7-9]. Further previous studies have used the intermittent negative pressure therapy and the vacuum-assisted precise tissue release to improve peripheral lymphedema, enhance circulation and assist blood perfusion for the treatment of cellulite [2, 8]. Cupping suction improves the micro-circulation because of the endothelial-derived nitric oxide liberation via a shear stress effect caused by the action of repeated suction [18]. The wonderful effect of cupping massage in eliminating inflammatory edema together with the intelligence of nitric oxide in enhancing the micro-circulation are sufficient, after eradication of the pathologic etiology, to clear out the miserable skin features of cellulite.

Fundamental definitive cure is treatment of the cause with elimination or withdrawal of pathology not just treatment of the symptoms. This study is concerned essentially with eradication of the colonic ***H. pylori*** strains which are the hypothesized pathogenic reason of cellulite together with preventing recurrence of the pathologic etiology via vinegar therapy and cure of symptoms by means of suction cupping therapy massage. The possible reason that previous efforts in treatment of cellulite did not achieve definitive or exclusive results is focusing their work on cure of symptoms but not the causative pathology. In brief, this study was working on three main elements which are withdrawal of pathology via the natural senna purge, avoiding recurrence of pathology by employing the vinegar therapy and curing the symptoms via improving tissue edema, encouraging blood and lymphatic circulation and enhancing the micro-circulation by means of the suction cupping therapy massage [16-18].

Revision of literature studies for comparative reasons with rather similar sample size of subjects revealed that treatment of cellulite features without eradication of the underlying pathology brought inadequate results and the resulting improvement was not satisfactory or persistent. In a multi-center study of side-firing laser therapy for cellulite treatment among 57 individuals using clinical photographs for evaluation of the results of therapy, it was found that the average improvement score at 6 months was 1.7 for dimples and 1.1 for contour irregularities while at 12 months the average improvement score was 1.4 for dimples and 1.0 for contour irregularities on a 5-point scale [41]; it means that improvement declined in short time. In a further study of laser cellulite treatment combined with laser-assisted lipoplasty of buttocks and thighs among 16 subjects using Nurnberger-Muller scale and global aesthetic improvement scale for evaluation of therapy, similar results were also achieved [6]. In a study of the effect of noninvasive ultrasonic lipolysis for treatment of abdominal cellulite among 28 subjects where evaluation of results was based on contour measurement, a significant average of 1.89 cm decrease of circumference was observed in each ultrasonic lipolysis therapy session whereas the mean pre-treatment to post-treatment circumference reduction was 8.21 cm that declined to 7 cm at the three-month follow-up visit [11]; which is also a short time. Radiofrequency employed for 25 females receiving six-weekly treatments for abdominal cellulite has given suboptimal clinical or delayed therapeutic effect of 25-49% after 1-4 weeks follow-up as evaluated by the standard photographs and the measurement of abdominal circumference, improvement was also not sustained as it was less in the fourth week follow-up visit [13]. Based on independent assessments by the subjects and investigators, cryolipolysis has shown consistent but mild to moderate improvement on skin texture/laxity and the cellulite [15]. A further study in favor of cryolipolysis in fat reduction in the flanks among 19 subjects reported reduction of fat as measured by ultrasound in 79% of subjects but a variety of side-effects such as paradoxical adipose hyperplasia or adipose hypertrophy following cryolipolysis were also encountered [42-44]. Efficacy of slimming creams was tested on 15 females for circumference reduction employing

a standard visual scale score, thigh and upper-arm circumferences decreased by 0.7 cm and 0.8 cm respectively after 6 weeks but itching and flushing were commonly reported [3]. Single treatment of vacuum-assisted precise tissue release for the treatment of cellulite was done for 55 women with moderate to severe cellulite employing the blinded assessments of subject photographs, a validated Cellulite Severity Scale and the Global Aesthetic Improvement Scale. The mean baseline score of 3.4 decreased to 1.3 at 3 months and 1.4 at one year [2]. Intermittent negative pressure therapy was studied on 50 patients with lymphedema and it was found that it caused 7% improvement in the volume of edma; therefore, it was recommended to be included in the treatment of cellulite [8]. Throughout this comparison, the vacuum assisted precise tissue release and intermittent negative pressure therapy seem most promising, safe and satisfactory.

Procedure	Subjects No	Results	Decline of Effect	Side-Effects
Laser Therapy	57, 16	Mild-Moderate	+	Minimal
Ultrasonic Lipolysis	28	Mild-Moderate	+	-
Radiofrequency	25	Mild-Moderate	+	-
Cryolipolysis	19	Mild-Moderate	+	++
Slimming Creams	15	Mild	++	+
Vacuum-Assisted Tissue Release	55	Good	+	-
Intermittent Negative Pressure Therapy	50	Good	+	-
Combined Colon Clear& Cupping Suction Massage	30	V. Good	-	-

The table illustrates a comparison between different procedures of cellulite treatment as concerns the effect, sustain/decline of the effect of therapy and possibility of side-effects.

Cellulite is a complicated compromise; a woman with cellulite has to lose weight, reduce subcutaneous fat, get rid of tissue fluid retention, improve local and general circulation and enhance micro-circulation of the affected areas. All these criteria or most of them constitute challenges to patients and physicians which explains to a great extent why investigators did not approach maintained satisfactory results in treatment of cellulite. The combined senna purge, vinegar therapy and suction cupping therapy massage via withdrawal of the most possible etiologic pathology which is the colonic ***H. pylori*** strains could help to reduce weight and body fat, push out tissue edema and encourage general and micro-circulation [16-19, 33].

Several measures has been planned to guide assessment of therapy in cellulite such as biometric thermo-graphic images mapping of the skin, the modified Nurnberger-Muller scale, global aesthetic improvement scale, validated Cellulite Severity Scale, ultrasound-measured subcutaneous tissue thickness, the standard visual scale score and standardized clinical photographs with measurements of body weight and abdominal circumference [2, 3, 6, 7, 13].

Clinical evaluation of the results of therapy among women of the current study demonstrated consistent improvement in the skin texture, skin laxity, body weight, BMI, reduction of fat and improvement of cellulite as independently assessed by the women themselves and the investigators. Independent assessment was followed in this study as individual satisfaction was considered an adequate judge for clinical improvement. A further study has employed the independent assessment of the results of therapy in cellulite based on individual's satisfaction and investigators evaluation, it was found that this way of assessment is satisfactory and practical [15]. Independent assessment by individuals and investigators could be just adequate so long the improvement is frank and obvious as the individual satisfaction is the main target of therapy. Previous records of the research team of this study denoted that patient satisfaction in skin problems could be a reliable monitor for clinical improvement as the skin appearance is the important target and patient satisfaction with his skin would be therefore an adequate mirror image for improvement of the clinical condition.

8. Conclusions

Clinical evidences seem supporting the finding that the abnormal existence of colonic ***H. pylori*** might be a hidden reason behind the recent medical challenge for most women known as the "***cellulite***"; therefore, eradication of these colonic ***H. pylori*** strains via natural measures could be an effective scientific approach to control the spread of cellulite worldwide. Combined senna purge and vinegar therapy together with suction cupping therapy massage could be promising simple, safe and effective measure for sustained treatment of cellulite among people with positive colonic ***H. pylori*** strains.

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