An open clinical study to evaluate the efficacy and safety of Chiropex in Plantar Xerosis

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ABSTRACT:
Dryness of the skin is a common condition in many systemic conditions and due to dryness in the environment. Dryness of foot or plantar Xerosis in particular can lead to pruritus, hardness, cracks and fissures in the skin if left untreated. Aim: The study was conducted to evaluate the safety and efficacy of Chiropex in plantar Xerosis. Materials and methods: This was an open clinical study conducted in subjects of plantar Xerosis after getting an approval from the ethical committee. Hundred subjects including both male and female, aged between 18-50 years clinically diagnosed to have plantar Xerosis after physical and systemic examination not associated with any pre existing systemic illness and who were willing to give an informed written consent were considered for the study. All the subjects were advised to wash the feet and then apply a small quantity of Chiropex cream on the affected area twice daily for the period of 2 weeks. All subjects were followed at weekly intervals for a period of 2 weeks. Assessment parameters included cracks in heels, dryness of soles, pain in the heel, soothing and moisturizing effect. Results: All the hundred subjects completed the study period. Results have shown beneficial effect of Chiropex for all the parameters with a significance of p<0.001 as compared to values at entry and week 1 values and there were no adverse effects either observed or reported during the clinical study and overall compliance to treatment was found to be good. Conclusion: Therefore, it may be concluded that, “Chiropex” is effective and safe and is faster in the management of individuals suffering from Plantar Xerosis.

Key words: Plantar Xerosis, Chiropex,

Introduction:
The loss of moisture from the stratum corneum and intercellular matrix leads to dry skin, or xerosis.1 Dry skin or xerosis is a common condition that frequently requires therapeutic intervention. Xerosis is characterized by aggregated desquamating corneocytes with the appearance of fine white scales; clinically, it is often accompanied by decreased mechanical flexibility of the stratum corneum, fine fissures, inflammation, and sensations of itching and burning. The condition is believed to stem from impaired water-binding capability in the stratum corneum. It is aggravated by exposure to low temperatures and low indoor humidity in winter months commonly found in northern climates. Furthermore, other adverse environmental conditions such as exposure to detergents and solvents, subclinical dyskeratotic disorders and age support the clinical manifestation of xerosis.2

Clinically dry skin appears rough, uneven, and cracked. Raised or uplifted skin edges (scaling), desquamation (flaking), chapping, and pruritus may be present. A person who has a decrease or loss of function of the sweat glands on the plantar surface of the foot will experience xerosis of the feet or plantar xerosis.3 This can be a painful condition that can cause bleeding. The incidence of xerosis increases with age, exposure to dry environmental conditions, like living in a dry climate, obesity consistently walking barefoot or wearing sandals or open-backed shoes, and physiological changes that alter circulatory supply to the lower extremities. Plantar Xerosis can become more dangerous if they go untreated and become deep or infected. This is especially dangerous for people with diabetes or compromised immune systems. Other factors can be poor feet structures, abnormal gait that produces calluses on the heel, Thyroid disease, Psoriasis etc. Among systemic diseases, primary biliary cirrhosis is one commonly associated with xerosis.4 Drugs like EGFR inhibitors can also produce xerosis as an adverse event.4

People with diabetes have a high incidence of xerosis of the feet, especially on the heels. While assessing for predictors of foot lesions in patients with diabetes, one study found that...
82.1% of the patients had skin with dryness, cracks, or fissures. Dry skin often leads to cracks and fissures, which can serve as a portal of entry for bacteria. These cracks and fissures are associated with an increased risk of cellulitis and foot ulceration, that, if left unchecked, can eventually necessitate amputation. Areas of dry, thick skin in the plantar aspect of the foot can raise pressure in that area. Callus formation is the result of the body's protective response to areas of high pressure. Unfortunately, this protective mechanism can become a vicious cycle. An area of dry skin or high pressure causes the body to develop callus, increasing pressure to that area; the body’s response to this increased pressure is to build even more callus. High foot pressures have been associated with high risk of developing foot ulcers in patients who have diabetes; in addition, high plantar foot pressure has a high specificity for predicting the development of foot ulceration. Though not well studied, the sheer force in the feet also may be a risk factor for developing a foot ulcer. The soft, elastic skin may reduce pathological shear force; thereby, preventing ulceration.

The importance of examining patients' feet and offering instruction in preventive foot care by physicians and diabetes educators is often overlooked. Xerosis can be controlled with moisturizers. Moist, elastic skin, resulting from using a moisturizer, can help prevent further foot complications.

Numerous humidifying topical preparations containing emollients and humectants have been used over the years for the treatment of dry skin, as well as for more acute dermatological disorders including ichthyosis, psoriasis, actinic damage, eczema, and the like which exhibit dry skin symptoms. Many such preparations primarily affect the skin's outer layer, the stratum corneum, and act as a partial replacement for the damaged stratum corneum.

ChiropeX is a polyherbal formulation containing potent herbs possessing moisturizing, anti-microbial, analgesic, and wound healing activities. ChiropeX was evaluated for its efficacy and safety in individuals suffering from Plantar Xerosis.

Aim:

This study was planned to evaluate the clinical efficacy and safety (short-term) of ChiropeX in Plantar Xerosis.

Materials and Method:

Hundred subjects who are willing to participate in the study were given detailed description about the investigational product, nature and duration of the study. Also subject's responsibilities after entering the study were explained. Subjects were pre screened by the investigators for the criteria indicated in the subject selection section. Only subjects who met the requirements of this section, have signed an informed consent form and subjects who were willing to follow instructions given by the investigator and have an updated medical history on file with the investigator were entered in the study.

Informed consent process:

A written informed consent by the subject was obtained from each study subject. The investigator provided information about the study verbally as well as using a patient information sheet, in a language that is non technical and is understandable by the study subject. The investigator gave adequate time for the subject to read it before the informed consent is signed. The subjects consent was obtained in writing using an “informed consent form”. The investigator retained the original copy of the signed informed consent and the subject received a copy of the signed informed consent.

Inclusion Criteria:

Hundred subjects of both sexes, from the age group of 18-50 years, who were clinically diagnosed with Plantar Xerosis with symptoms like the hard, dry and flaky cracking of the skin of the heels, and who were willing to give informed consent were enrolled in the study

Exclusion criteria:

Subjects with conditions of dermatitis due to medication & skin infection were excluded from the study. Also subjects with pre-existing systemic disease necessitating long-term medications, endocrinial disorders, subjects with known history or present condition of allergic response to any cosmetic/ pharmaceutical products, toiletries or its components or ingredients in the test products and those who refused to give informed consent, were excluded from the study. Pregnant and lactating women were also excluded from the study.

Study procedure:

All enrolled subjects underwent a thorough physical and local skin examination; hundred subjects received ChiropeX cream. All subjects were advised to wash the feet and then apply a small quantity of ChiropeX cream on the affected area in a circular motion over the dry and cracked heels twice daily for the period of 2 weeks. All subjects were followed at weekly intervals for a period of 2 weeks.

Follow-up and assessment:

Subjects were assessed at entry, week 1 and week 2. Assessment parameters included cracks in heels, dryness of soles, pain in the heel, soothing and moisturizing effect. Assessment of parameters...
was done on the basis of following grading scale: 0: No cracks, 1: Dry soles with one or two cracks, 2: 5-7 cracks, 3: Many superficial cracks with slight pain, 4: Slight deep cracks with moderate pain, 5: Deep cracks with severe pain and bleeding which causes difficulty in walking.

Dryness of sole- 0: No dryness, 1: Slight dryness, 2: Dryness only at the cracks, 3: Dryness over the entire sole. Pain in the heel was expressed in a scale of 0-3 where 0-nil to 3-severe. Soothing effect and moisturizing effect was expressed in a scale of 0-4, where 0-Poor, 1-fair, 2-moderate, 3-Good, 4-excellent. The scoring was in turn correlated with response to the treatment as follows: 0: no improvement, 1: Poor response, 2: Good response, 3: Excellent response. Soothing and moisturizing effect- 1: No change, 2: Fair, 3: Good, 4: Very good, 5-Excellent.

At each follow-up visit, the investigator recorded any information about intercurrent illness, therapeutic interventions and concomitant medication/s. All the adverse events reported or observed by patients were recorded with information about severity, date of onset, duration, and action taken regarding the study drug.

Adverse event assessment

At each follow-up visit, the investigator recorded information about intercurrent illness or infections and concomitant medication. All the adverse events reported or observed by patients were recorded with information about severity, date of onset, duration, and action taken regarding the study drug.

Relation of adverse events to study medication was predefined as “Unrelated” (a reaction that does not follow a reasonable temporal sequence from the administration of the drug), “Possible” (follows a known response pattern to the suspected drug, but could have been produced by the subject’s clinical state or other modes of therapy administered to the subject), and “Probable” (follows a known response pattern to the suspected drug that could not be reasonably explained by the known characteristics of the subject’s clinical state).

Primary and secondary endpoints:

The predefined primary efficacy endpoints were clinical improvement and symptomatic control in Plantar Xerosis. The predefined secondary endpoints for short-term safety were assessed by incidence of adverse events during the study period, and overall compliance to the drug treatment.

Statistical Analysis

All values are expressed as compared to “At entry” as Mean ± SD. Results were analyzed statistically by Repeated Measures of ANOVA using Friedman test followed by Dunnett’s multiple comparison test to find out the level of significance. Analysis was performed using Graphpad prism software Version 4.03, San Diego, California, USA.

RESULTS:

A total 100 subjects were enrolled in the study. The demographic details of the subjects at entry are listed in Table 1.

100 subjects showed reduction in the cracks and other symptoms, which is summarized in Table 2. The improvement trend was seen from week 1 till the end of the study. There were no clinically significant adverse reactions, either reported or observed, during the entire study period and overall compliance to the treatment was good.

The evaluation of various parameters on the effect of Chiroprpe has been shown in table 2. Reduction of cracks in heels at entry was 2.93±0.33 which after treatment with Chiroprpe reduced to 1.93±0.26 at week 1 and further reduced to 0.81±0.47 at week 2. Similarly reduction in dryness of soles was noted from 2.92±0.34 at entry to 1.86±0.38 at week 1 and further reduced to 0.65±0.58 at week 2 with the treatment of Chiroprpe. Pain in heels reduced from 2.05±0.22 at entry to 1.58±0.46 at 1st week and 0.72±0.34 at 2nd week. Cracks in the heels, dryness of soles and Pain in the heels showed a significant improvement at the end of 2 weeks as compared to values at entry (p<0.001) as well as compared to week 1 values (p<0.001). Similarly soothing and moisturising effect was also showed significance of p<0.001 at 2 weeks as compared to values at entry and at week 1 values.

Soothing effect improved from 2.03±0.56 at entry to 2.61±0.67 at week 1 and 3.27±0.33 at week 2. Similarly moisturising effect also showed improvement from 2.06±0.49 at entry to 2.72±0.67 at week 1 and further it increased to 3.47±0.26 at week 2.

Statistical analysis conducted has shown that all the parameters had shown beneficial effect on Chiroprpe with a significance of p<0.001 as compared to values at entry and week 1 values. There were no adverse effects either observed or reported during the clinical study and overall compliance to treatment was found to be good.

DISCUSSION:

Chiroprpe cream is a polyherbal cream that contains natural moisturising factors, essential fatty acids and vitamin E. After its application, easily gets absorbed in all types of skin including...
dry, and thick skin. It gets faster absorbed and gives relief faster. It absorbs and retains moisture and relieves dryness and itching. Its regular applications smoothen and soften the skin. It is non-greasy and non-staining as well.

Chiropex cream contains Madhu (Honey), Oils of Atasi (Linum usitatissimum), Karanja (Pongamia pinnata), Ushira (Vetiveria zizanioides), Barbari (Ocimum basilicum), Jambira (Citrus limon) and Peppermint satva (Trachyspermum ammi).

Clinical observations suggest that honey holds significant promise as an effective treatment for a number of medical conditions and particularly in the management of non-healing wounds. Chrys is a natural, biologically active compound extracted from honey possesses potent anti-inflammatory, and anti-oxidation properties. Honey acts mainly as hyperosmolar medium and prevents bacterial growth. Due to this, it helps to rapid absorption of edema fluid from the soggy wounds. Due to high viscosity of honey, it forms a physical barrier that prevents bacterial colonization in wounds and creating a moist environment, which helps to accelerate the wound healing process. The nutrient contents of honey such as laevulose, and fructose improve local substrate supply and help epithelialization.

Oil of Linum usitatissimum contains 57.83%, α-linolenic acid, and Omega-3-fatty acid in major. The fixed oil of Linum usitatissimum inhibits PGF2-leukotrine, histamine, and bradykinin induced inflammation. The oil has also been reported to reduce arachidonic induced inflammation, suggesting its capacity to inhibit both cyclooxygenase and lipoxygenase pathways of arachidonate metabolism. These activities are suggested due to the presence of α-linolenic acid and omega-3-fatty acid. The seed oil has skin conditioning activity that is used to create special effects on skin and enhances the appearance of dry or damaged skin and sustantative materials which adhere to the skin to reduce flaking and restore suppleness.

Oils from Pongamia pinnata are rich source of fatty oil and have been reported with antimicrobial activity against common pathogens. In Ayurvedic practice, the seed-oil of Pongamia pinnata is used in itches, abscess and other skin diseases. Various extracts of the seed are used in other skin conditions like leucoderma, and leprosy. The seed oil has skin conditioning activity that reduces the flaking and dryness of skin and restores the skin texture.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Parameter</th>
<th>Score (Mean±SD)</th>
<th>Statistical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cracks in heels</td>
<td>2.93±0.33</td>
<td>0.81±0.47</td>
</tr>
<tr>
<td>2</td>
<td>dryness of soles</td>
<td>2.92±0.34</td>
<td>0.65±0.58</td>
</tr>
<tr>
<td>3</td>
<td>Pain in heels</td>
<td>2.05±0.22</td>
<td>0.72±0.34</td>
</tr>
<tr>
<td>4</td>
<td>Soothing effect</td>
<td>2.03±0.56</td>
<td>3.27±0.33</td>
</tr>
<tr>
<td>5</td>
<td>Moisturising effect</td>
<td>2.06±0.49</td>
<td>3.47±0.26</td>
</tr>
</tbody>
</table>

Note: a is Significance at week 2 as compared to values at entry and
b is Significance at week 2 as compared to week 1 values.
Oil from Vetiver contains sesquiterpenes including their derivatives like –vetivone, khusimol in major and has reported with antimicrobial and refrigerant activities. Oil of Ocimum basilicum is rich in chavicol methyl ether or estragole, linalool and eugenol. The studies in literatures suggest Linalool has been reported with antibacterial activity. Salmah et al in their trial have reported about the wound healing potential of Ocimum basilicum extract after topical application. Ocimum basilicum oil has skin conditioning activity that reduces the symptoms associated with dry skin to regain its suppleness.

Limonene present in Citrus limon oil has reported with antibacterial and anti-fungal activities. Lemon Oil has skin conditioning activity that keeps skin healthy and promotes the protective functions of the skin. The seed extract of Trachyspermum ammi has been reported with wound healing promoter activity on repeated use. Traditionally, the seed extract is also used in hemorrhagic septicaemia.

Chirope cream has the above described potent herbs with moisturizing, antimicrobial, analgesic, and wound healer promoting activities. Its moisturizing activity helps to smoothen and soften the skin. Its anti-microbial activity helps to prevent from common contaminations. Its analgesic activity helps to reduce pain. Its wound-healing promoter activity helps to heal the Plantar Xerosis faster.

CONCLUSION:

This clinical study clearly shows that significant symptomatic relief was observed with Chirope cream in individual suffering from Plantar Xerosis. Statistical significant beneficial effect was observed with Chirope treatment in the parameters like cracked heels, dryness of soles, pain in the heels, Soothing effect and Moisturising effect. There were no adverse effects either observed or reported during the clinical study. All the subjects completed the study and overall compliance to treatment was found to be good. Therefore, it may be concluded that, “Chirope” is effective and safe and is faster in the management of individuals suffering from Plantar Xerosis.

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