

Case series of leech application in chronic Karappan

Anpuchelvy, S.¹, Sritharan, G.^{2*}

¹Unit of Siddha Medicine, University of Jaffna, Sri Lanka,

²Herbal health Care Center, Kokuvil, Jaffna

gsritharan09@gmail.com

Abstract - Skin diseases are the most common health problem in worldwide and are associated with a considerable burden. Karappan (Eczema) is a skin ailment which cause psychological, social and financial burden on the patient and their families. Management of eczema with antibiotics, antihistamines, steroids ect, are available but even after their use relapse, recurrences and other complications are very common. The study was to assess the efficacy of leech application in the management of Karappan (Eczema) with standard clinical parameters. This study without control group was conducted with 27 patients having the classical symptoms of karappan (Eczema) and selected as per the inclusion and exclusion criteria. Minimum four sitting of leech application were carried out with 7 days interval and pre and post treatment evaluation of the patient was done with Eczema area and severity Index (EASI) SCORE, SCORE of atopic dermatitis (SCORAD) index and Dermatology Life Quality Index (DLQI). The total EASI score showed considerable reduction up to 54.45 % (p<0.01) and the SCORAD) index significantly reduced by 55% (p<0.01). The life quality of the patient calculated by DLQI and improved significantly by 62.36% (p<0.01). Leech application gives significant relief for the symptoms of Karappan (Eczema). The life quality of the patient also improved significantly after leech therapy. No adverse reaction was reported during the entire course of study.

Key words :Karappan, Eczema. Dermatology, Leech application

I. INTRODUCTION

Skin is an extraordinary structure. It is frequently damaged because it is directly in the "firing line" and for this reason, skin disease are very common. There are more than 3000 known disease of the skin [Bickers et al.2004]. Although most of the chronic skin conditions, such as eczema, psoriasis, vitilligo and leg ulcers are not immediately life – threatening, there are recognized as a considerable burden on health status and quality of life, including physical, emotional and financial consequences. Karappan (Eczema) or dermatitis is a pattern of the inflammatory response of the skin, which is characterized by erythema, edema, vesiculation, exudation and crust formation [Schal, 2004].

Management of (Karappan) Eczema involve topical applications such as emollients lotions, steroids, coal tar and zinc paste ect, oral antibiotics, sedative, antihistamins, corticosteroids and immunosuppressive agents [Dermnetz. org2013]. Even after their use relapse, recurrences and other complications are very common. Indiscriminate use of these drugs can cause vomiting, diarrhea, stomach upset, allergic reaction, peptic ulcer, neuropsychiatric reactions, diabetes, diminution of libido, Cushing's syndrome, ect.

Siddha medicine, karappan noi can be related to Eczema. Though there are seven types of Karappan in Siddha, according to Yugi muni's classification. But mainly we see two types of it clinically categorized as dry type and wet type. In dry type, itching is seen followed by scaling, hyperpigmentation, hyper keratinisation. In wet type itching followed with vesicles , oozing , then hyperpigmentation and only in later stage hyperkeratanisation. Karappan starts local itching.

Common Causes : Some of the common causes of Karappan are Skin Irritants(Both physical and Chemical), Occupational hazards, Cosmetics, Effects of medication, Any external infection, Long Mental and Emotional Stress, Improper digestion due to dietary changes or eating habits, Nutritional deficiency, Drug allergy etc.

In this present study, among the various methods of bloodletting, Leech application was selected. Biochemical released from leech saliva have anti-inflammatory, antibiotic, thrombolytic actions [Michalsen 2008]. Further leeches can be easily administered with less complication and cost effective.

Objective

The study was to assess the efficacy of leech application in the management of Karappan (Eczema).

II. METHODOLOGY

Case series was done with 27 patients having the classical symptoms of Karappan (Eczema). The patients were selected from Herbal Health Care Centre, Kokuvil, Jaffna as per inclusion and exclusion criteria. The criteria for diagnosis was based up on the classical signs and symptoms of Eczema . The inclusion criteria included patients of age group 16-70 years. The exclusion criteria included, patients having secondary infection, bleeding disorders, diabetic mellitus, heart diseases.

and generalized eczema. A specific case sheet was prepared, and the patients of the present study were examined in detail as per case sheet. Routine hematological investigations and urine examinations were carried out before and after treatment to rule out the other associated pathology. The patients were included for study after taking written consent.

Treatment

Minimum four sitting of leech application therapy was carried out with 7 days interval. Number of leeches applied was decided on the basis of the size of the lesion. The patients were not given any other concomitant medications for eczema. Procedure of leech application, was undertaken in the following stage.

Preoperative Procedure

Nonpoisonous leeches were identified [Murthy 2006], and collected from fresh water sources; they were stored in mud pots. Day of application, the patient was placed on proper position according to the site of lesion. Leeches were kept in turmeric water to make them active, increase appetite and free from natural urges, after keeping the leeches for 45 min they were put in fresh water.

Operative Procedure

Lesion is cleaned by water and dried with cotton. After this, rubbing of the skin was done as per need. For this purpose, either sterilized cotton bandage pad or thick thread of jute was used. The activated leeches were applied over the lesion site. Leech become elevated like a horse shoe or raised in an arched position from its neck that indicates that they are sucking the blood vigorously or strength fully. After catching the site, leeches were covered with wet cotton pad and regularly sprinkled with cold water. The leeches usually detach from the site after sucking the vitiated blood or have to be removed by striking salt over it when the patient complains pain or itching.

Postoperative Procedure

After detachment of leech, wound was cleaned with anti-septic solution and after that tight bandage was applied for prevention of secondary hemorrhage. After falling off, the leech was dusted with rice powder and turmeric powder was applied on the mouth freely without sinking down, were considered as properly vomited. Used leeches were kept in a separate pot containing pure water and used for the same patient after a gap of 7 days. The frequency of leech application varied according to the disease and severity. Generally every leech was applied once a week up to 4-6 sitting. For every patient separate leeches were assigned to avoid cross infection (Harishastri 2006).

Leech therapy is contraindicated in the following condition. They are blood clotting disorders, severe anaemia, allergic

reaction to active substance of the leech such as hirudin, hyaluronidase, egline, apyrase, destabilase and pregnancy. Precautions during leech application

The following precautions should be taken during leech application. The bleeding and clotting time of the patient should be normal, care should be taken in handling leeches, that is, they should be handled gently and leeches have to be covered with wet cloth.

Assessment Criteria

All the patient were examined weekly during the treatment. Assessment was done on the basis of relief in the sign and symptoms of the disease Eczema. For this purpose the following scoring methods were adopted

1. EASI [Hanifin et al 2001].
2. SCORAD Index [SCORAD index 1993].
3. DLQI [<http://w.w.w.dermatology.org.uk>]

Eczema Area and severity Index score is tool used to measure the severity and extent of atopic eczema. The intensity of redness (erythema), thickness (induration, population, edema), scratching (excoriation) and lichenification (lined skin) of the eczema is assessed as none (0), mild (1), moderate (2), severe (3). The four intensity score are added up for each of the four body regions (head and neck, trunk, upper limb and lower limb). The percentage area affected by eczema is evaluated in the four regions of the body. In each region, the area is expressed as nil (0), 1-9% (1), 10-20% (2), 30-49% (3), 50-69% (4), 70-89% (5) or 90-100% (6) [[Htp://w.w.w.dermnetnz.org](http://w.w.w.dermnetnz.org)].

Scoring of Atopic Dermatitis is a clinical tool used to assess the extent and severity of eczema. The rule of 9 is used to calculate the affected area, as a percentage of the whole body. The intensity of redness, swelling, oozing, scratching and sleeplessness are each scored by the patient or relative using a visual analog scale where 0 is no itch or no sleeplessness and 10 is the worst imaginable itch or sleeplessness) [[Htp://w.w.w.dermnetnz.org/dermatitis/scored.html](http://w.w.w.dermnetnz.org/dermatitis/scored.html)].

Follow-Up

The follow-up was carried out up to 6 months from the end of the treatment with interval of 15 days to rule out progression of the disease and adverse reactions.

III. RESULTS

The average age of patients was 50.12 years and 70% were male. Itching and oozing were among the main complaints of the patients, and 62.96% of patients had chronicity of years. Table 1: Overall effect of Leech application in eczema with reference to EASI SCORE

Enai score (Eczema area and severity index)	Mean	SD	% of reduction	Paired t-test
Redness				
B.T	1.07	1.04		
A.T	0.33	0.68	69.15%	4.2640**
v				
B.T	2.74	0.53		
A.T	1.44	0.70	47.29%	7.6172**
Scratching				
B.T	2.70	0.61		
A.T	1.37	0.74	49.31%	11.1713**
Lichenification				
B.T	2.70	0.47		
A.T	1.56	0.58	42.46%	11.1772**
% Area				
B.T	1.19	0.62		
A.T	1.04	0.44	12.49%	1.6879**
Total				
B.T	4.33	2.78		
A.T	1.97	1.12	54.45%	5.8202**

NS: Not significant at 5% level. **: Significant at 1% level. BT: Before Treatment, AT: After Treatment

Table 2: Overall effect of Leech application in eczema with reference to SCORAD INDEX

Scorad Index (Scoring of atopic dermatitis)	Mean	SD	% of reduction	Paired t-test
Extent criteria				
B.T	4.01	1.95		
A.T	3.07	1.41	24.54%	2.7041NS
Intensity criteria				
B.T	12.46	1.93		
A.T	6.00	2.32	51.78%	14.2352**
Subjective symptoms				
B.T	14.76	2.25		
A.T	6.96	2.50	52.54%	16.5187**
Total score				
B.T	3.20	0.40		
A.T	1.44	0.52	55%	16.0649**

NS: Not significant at 5% level. **: Significant at 1% level. BT: Before Treatment, AT: After Treatment

Table 3: Overall effect of Leech application in eczema with reference to DLQI

Dermatology life quality index (dlqi)	Mean	SD	% of improvement	Paired t-test
B.T	10.04	4.407		
A.T	3.78	1.76141	62.36%	8.0005**

** : Significant at 1% level. BT: Before Treatment, AT: After Treatment

IV. DISCUSSION

Among different methods of bloodletting, leech application is considered to be more scientific and safe. The medicinal leech is a beautiful symbol of “give and take” and is sustainable resource management. *Hirudo medicinalis* is one of the oldest surviving animals on earth. The first documented accounts of the use of leeches for medicinal purpose is from the time of extreme antiquity, more than 2500 years before in Ayurvedic texts, then long later during the period of Hippocrates. Dhanvantari, the physician of gods and the god of Ayurveda hold a leech in one of his hand. This simply suggests the importance of leeches in the medicinal field by ancient Indian science. Leeches have and will always be thought of as the “wonder doctors” of science.

The probable mode of action of leech application in eczema ā can be explained in the following way. The

anti-inflammatory substances present in leech saliva like Eglins and Bdellins [GrossU, Roth 2006], are responsible for reduction of erythema (redness) and oozing. Leech application induces granulation tissue formation [Gross 2008]. which in turn results in collagen formation causing keratolysis resulting in reduction of thickness in eczema. Leech application induces microcirculation [Zavalova et al 2000] and reduces inflammatory components like lymphocytes; these factors play an important role in reducing itch impulse (in turn scratching). Leech application reduces acanthosis (thickened epidermis) and scratching which are the causative factors for lichenification. Leech saliva contains hylaurinadase which has antibiotic properties [GrossU, Roth 2006] and that may be responsible for the reduction of oozing in eczema.

Although leeches may not be safe for people with diseases that impair blood clotting or for those with compromised immune function, it is believed to be safe for most other people. The saliva of leeches contain a variety of substances such as hirudin, hylaurinadase, histamine like vasodilators, collagenase, destabilize, [Zavalova et al 2000] inhibitors of kallikerin, super oxide production and poorly characterized anesthetic and analgesic compounds [Baskova et al 1985].

These substances reach epidermis and dermis by the action of enzyme hylaurinadase. It has been proved through laser Doppler flowmetry that there is a significant increase in superficial skin perfusion following leech application, especially 16 mm around the biting zone [Connor et al 2012]. Therefore, a regional antiphlogistic, thrombolytic and antibiotic effect by these substances enforced by hylaurinadase might be the possible reason of improvement by treatment with leeches. The jaws of the leech pierce the skin so that potent biologically active substances can penetrate into the deeper tissues. Hylaurinadase (spreading factor), an enzyme in leech saliva, further facilitates the penetration and diffusion of these pharmacologically active substances into the tissues.

Venous congestion is an important complication that threatens the viability of the affected areas. It can be best treated with the application of the leech. Leech therapy has two phases, active bloodletting and passive bleeding from the leech wound after detachment, which can last for several hours. The small blood volume removed by medicinal leeches and the augmented blood removed during the passive bleeding phase of leech therapy results in a remarkable decrease in

venous congestion. In addition to this, a broad number of anticoagulant agents decrease venous congestion such as the thrombin inhibitor hirudin, apyrase, as well as collagenase, hylaurinadase, factor Xa inhibitor and fibrinase I and II. [Sviridkina et al 2008].

V. CONCLUSION

In the present study it was found that, leech application gives significant relief to the symptoms of eczema such as erythema, edema, oozing, excoriation and lichenification, etc., The life quality of the patient also improved significantly after leech therapy. In the study, during the follow-up period of 6 months the disease progression was static in most of the patients. No adverse reactions were reported during the entire course of study.

Hence the application of leeches in the cases of eczema can be an effective treatment for chronic eczema. The study suggests the utility of leech application in other inflammatory disorders.

References

1. Bickers DR, Lin HW, Margolis D, Weinstock MA, Goodman C, Faulkner E, et al. The burden of skin disease: 2004
2. Sehal NV. Text Book of Clinical Dermatology. 4th ed. New Delhi 2004 p.19
3. Dermnetz.org. New Zealand Dermatological Society; 2013, available from <http://www.dermnetz.org>.
4. Michalsen A, Ludik R, Cesur O, Afra D, Musial F, Baccker M, et al. Effectiveness of leech therapy in women with symptomatic arthrosis of the first carpometacarpal joint; A randomized controlled trial. 2008; 137:452-9
5. Harishastri P.V. editor Varnasi: Chaukamba Krishnadas Academy; 2006, Vagbhata's Astanga Hridaya; p.323.
6. Murthy KR, Translator, Varnasi Chaukamba Orientalia 2006, Sarangadhara Samhita p.255
7. Hanifin JM, Thurston M, Omoto M, Cheril R, Tofte SJ, Graeber M, The eczema area and severity index (EASI): Assessment of reliability in atopic dermatitis, EASI Evaluator Group. *Exp Dermatol.* 2001; 10:11-8
8. Severity scoring of atopic dermatitis: The SCORAD index. Consensus Report of European Task Force on Atopic Dermatitis *Dermatology.* 1993; 186; 23-31
9. Dermatology.org. Section of Dermatology, Department of Dermatology and Wound healing, School of Medicine, Cardiff University. Available from <http://w.w.w.dermatology.org.uk/quality/diqi/quality-dlqi.html>. (Last cited on 2017 Jun.14).
10. [Htp://w.w.w.dermnetz.org](http://w.w.w.dermnetz.org)
11. [Htp://w.w.w.dermnetz.org/dermatitis/scored.html](http://w.w.w.dermnetz.org/dermatitis/scored.html).
12. Gross U, Roth M, The biochemistry of leech saliva In; Michalsen A, Roth M, Dobos G, editors, Medicinal Leech Therapy. Stuttgart; Appl. Wembing; 2006. pp 137-8
13. Dhiman R, Sen S. Leech therapy and Ayurveda : An anthropological study. In. Pathak RK, editor Bio- Social Issues in Health. New Delhi; Northern Book Centre; 2008. p.248.
14. Zavalova LL, Baskova IP, Lukyanov SA, Sass AV, Snezhkov EV, Akopov SB, et al, Destabilase from the medicinal leech is representative of a novel family of lysozymes. *Biochim Biophys Acta.* 2000; 1478; 69-77.
15. Gross U, Roth M, The biochemistry of leech saliva In; Michalsen A, Roth M, Dobos G, editors, Medicinal Leech Therapy. Stuttgart; Appl. Wembing; 2006. pp 137-8
16. Zavalova LL, Baskova IP, Lukyanov SA, Sass AV, Snezhkov EV, Akopov SB, et al, Destabilase from the medicinal leech is representative of a novel family of lysozymes. *Biochim Biophys Acta.* 2000; 1478; 69-77.
17. Baskova IP, Nikonov GI. Destabilase; An enzyme of medicinal leech salivary gland secretion hydrolyzes the isopeptide bonds in stabilized fibrin, *Biokhimiia* 1985; 50;424-31.
18. Connor NP, Confort MI, Heisey DM, Vanderby R, Kunz D, Hartig GK, Augmented blood removal after medicinal leech feeding in congested tissue flaps, *J Rehabi Res Dev,* 2002; 39; 505 -12
19. Sviridkina LP, Borovaia EP, Makhneva AV, Hirudotherapy in combined sanatorium – spa treatment of patients with coronary heart disease, *Vopr Kurortol Fizioter Lech Fiz Kult,* 2008; 12-5.