Introduction

Systemic sclerosis (SSc) is a rare and progressive multisystem autoimmune disorder that is characterized pathologically by vascular abnormalities, sclerosis of skin, and internal organs with autoantibodies. Skin ulcers occur in 35–60% of SSc patients. The etiology of these ulcers is not well known, but these may reflect chronic vasculopathy. The treatment of chronic ulcers of the lower extremities presents a therapeutic challenge in modern medicine. In the text of Ayurveda, Rakta Dusti (Impurity of blood) is considered as one of the prime causes of skin diseases and patients may get relief after letting out the vitiated Rakta. In the present case, the patient was managed with leech therapy along with Ayurvedic medications in a very economical way.

Case History

A 34 years old female approached OPD with a foul-smelling, nonhealing, necrotizing ulcer over the dorsal aspect of the left lower leg above the heel for 1 month. She was a known case of diffuse cutaneous systemic sclerosis for 11 years. Her leg ulcer was not healing despite using the allopatic treatment for 2 months. Even with treatment, it got worsened so the fear of amputation of leg enforced her to take Ayurvedic consultation. After 1 month of treatment with leech therapy along with Ayurvedic medicines and 3 months of follow-up, the wound got healed. It is concluded that leech therapy with Ayurvedic medicines is highly effective for the management of nonhealing venous ulcers.
was 100% and undermining, necrotic tissue, exudate type, exudate amount, skin color surrounding the wound, peripheral tissue edema, peripheral tissue induration, granulation tissue, epithelization was 80% (result can be seen in Figure 1).

Discussion

There are many diseases that offer a challenge to the medical world, practitioners and also the scientific community to understand their pathophysiology and proper management. Autoimmune disorders are among such challenging diseases. Immunity plays a very determinant role in deciding the prognosis of disease as well as the outcome of management. It may be the interest of research to explore the beneficial effect of hypersensitivity response in modulating the latent immune response in the patient of autoimmune disorders. In this article, a case is discussed which is a known case of systemic sclerosis.

In this case use of *Jalouka* (leech) is based on the concept of provoking the immune response to stimulate the stem cells of skin for regeneration supplemented with Ayurvedic medicines. Leech therapy is a painless, minimal invasive technique of controlled bloodletting (*Raktamokshana*). In recent studies, more than 20 bioactive molecules having anti-inflammatory, analgesic, antimicrobial, and anticoagulant properties were reported from medicinal leeches. Based on clinical presentation the patient was diagnosed as a case of *Kshudra Kshtha* and the treatment was planned accordingly. As per the *dusha-dusya* involvement and the physical condition of the patient (cachexic), it was decided to use *Brimhana diktita* (nutritional palliative treatment for restoring the natural

### Table 1: Treatment given to the patient

| Date             | Drugs, dosage and amupana                                                                                                                                                                                                 |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20-7-19 (for 10 days) | (A) N3 churna (NGA) each 2 gm twice a day, with luke warm water (B) Gandhak rasayan 2 tablet twice a day with normal water                                                                                             |
| 30-7-19 (for 7 days) | (C) Combination of Rasamaniyka 60 mg, Pravalipshrit 125 mg and Trivangghasma 125 mg twice a day with honey                                                                                                               |
| 6-8-19 (for 15 days) | (A) Combination of Panchitaagangul 2 table spoon, Trikatu churna 2 gm and Shudhganthak 125 mg twice a day, with luke warm water (B) Yastimadhu churna and Kutaki churna each 2 gm, twice a day with luke warm water |
| 22-8-19 (for 15 days) | (A) Krimimudag rasa 125 mg and Vidang churna 3 gm twice a day with normal water (B) Amla swaras and Giloy swaras each 10 ml twice a day with normal water                                                                      |
| Follow up treatment | (A) Khadirarishta 3 table spoon twice a day with equal amount of water (B) Vidangadilauha 2 table spoon twice a day with normal water (C) Kumarkalyanasal 1 tablet twice a day for 20 days with normal water |
| 18-10-19 | (D) Panchnimbadi churna 3gm and Shudhagandhaka 125mg twice a day with normal water                                                                                                                                       |
| 8-11-19 | Combination of Amla churna 3gm Shirisha chalda churna 10 gm Trikatu churna 3 gm and Go ghrita 1 table spoon 20 ml kwaithrice a day decoction form                                                                                   |

### Table 2: Timeline of events (condition of the patient and her wound with time)

| Date     | Findings                              | Intervention                                                      | Outcome                                      |
|----------|---------------------------------------|-------------------------------------------------------------------|----------------------------------------------|
| 20-7-19 to 24-7-19 | Patient visited, diagnosed as Kshudra Kushtha and admitted | Ayurveda external treatment started [Table 1] Oral antibiotic linezolid 600 mg continued | No improvement in wound                      |
| 24-7-19 to 30-7-19 | Pyrexia 102˚F and Total Leucocyte Count 13600/cumm | (a) Previous ayurvedic medicines stopped and new medicines started [Table 1] (b) Leech therapy started 1st sitting on 24/07/19 followed by dressing with Hanida churna | Amount of discharge decreased                |
| 30-7-19 to 6-8-19 | Total Leucocyte Count 19460/cumm wound swab culture sent and found patient was resistant to Linezolid antibiotic | Previous medication was revised [as Table 1] 2nd sitting of leech therapy (on 30/07/19) | Discharge almost nil, no slough               |
| 6-8-19 to 13-8-19 | Pyrexia 103˚F | Yastimadhu churna + Kutaki churna added to control raised TLC 3rd sitting of leech therapy (on 06/08/19) | No discharge from wound                      |
| 13-8-19 to 19-8-19 | Wound looks healthy | 4th sitting of Leech therapy on 13/08/19 | No episode of pyrexia onward                 |
| 19-8-19 | Satisfactory wound healing | Previous medication repeated [Table 1] 5th sitting of leech therapy (on 20/08/19) | TLC dropped down to 1237/cumm                |
| 22-8-19 | Wound margins healthy and oortled with healthy granulation tissue | (a) New medicines prescribed [Table 1] | Ulcer with healthy granulation tissue        |
| 8-11-19 | Combination of *Phalasarpi* 2 table spoon, *Trikatu* churna 2 gm and Dhati lauha 125 mg, twice a day with normal water | (B) Combination of *Phalasarpi* 2 table spoon, *Trikatu* churna 2 gm and Dhati lauha 125 mg, twice a day with normal water | Patient discharged with healthy healing wound. Wound size and depth decreased Skin color Surrounding wound became red |
### Table 3: Findings of Bates-Jensen wound assessment tool for this wound

| Item | 22/7/19 | 8/8/19 | 9/9/19 | 8/11/19 | 22/11/19 | Percentage decline |
|------|---------|--------|--------|---------|----------|--------------------|
| 1. Size | 1=Length x width 80 sq cm | 5 | 4 | 3 | 2 | 0 | 100% |
| 2=Length x width 4–80 sq cm | 3 | 2 | 2 | 0 | 1 | 94% |
| 3=Length x width 16.1–80 sq cm | 4 | 3 | 3 | 2 | 1 | 85% |
| 4=Length x width 36.1–80 sq cm | 3 | 2 | 2 | 1 | 1 | 80% |
| 5=Length x width >80 sq cm | 2 | 1 | 1 | 1 | 1 | 78% |
| 2. Depth | 1=Non-blanchable erythema on intact skin | 5 | 4 | 3 | 3 | 2 | 60% |
| 2=Partial-thickness skin loss involving epidermis and/or dermis | 2 | 1 | 1 | 1 | 1 | 59% |
| 3=Full-thickness skin loss involving damage or necrosis of subcutaneous tissue; may extend down to but not through underlying fascia; and/or mixed partial and full-thickness and/or tissue layers obscured by granulation tissue | 3 | 2 | 1 | 1 | 1 | 61% |
| 4=Obscured by necrosis | 2 | 1 | 1 | 1 | 1 | 56% |
| 5=Full-thickness skin loss with extensive destruction, tissue necrosis or damage to muscle, bone or supporting structures | 1 | 1 | 1 | 1 | 1 | 51% |
| 3. Edges | 1=Indistinct, diffuse, none clearly visible | 4 | 3 | 2 | 2 | 2 | 60% |
| 2=Distinct, outline clearly visible, attached, even with wound base | 3 | 2 | 1 | 1 | 1 | 57% |
| 3=Well-defined, not attached to wound base | 2 | 1 | 1 | 1 | 1 | 54% |
| 4=Well-defined, not attached to base, rolled under, thickened | 1 | 1 | 1 | 1 | 1 | 49% |
| 5=Well-defined, fibrotic, scarred or hyperkeratotic | 1 | 1 | 1 | 1 | 1 | 46% |
| 4. Under-mining | 1=None present | 3 | 2 | 1 | 1 | 1 | 80% |
| 2=Undermining <2 cm in any area | 2 | 1 | 1 | 1 | 1 | 72% |
| 3=Undermining 2-4 cm involving <50% wound margins | 1 | 1 | 1 | 1 | 1 | 60% |
| 4=Undermining 2-4 cm involving >50% wound margins | 1 | 1 | 1 | 1 | 1 | 58% |
| 5=Undermining >4 cm or tunneling in any area | 1 | 1 | 1 | 1 | 1 | 54% |
| 5. Necrotic tissue type | 1=None visible | 3 | 2 | 2 | 1 | 1 | 80% |
| 2=White/grey nonviable tissue and/or non-adherent yellow slough | 1 | 1 | 1 | 1 | 1 | 76% |
| 3=Loosely adherent yellow slough | 1 | 1 | 1 | 1 | 1 | 72% |
| 4=Adherent, soft, black eschar | 1 | 1 | 1 | 1 | 1 | 66% |
| 5=Firmly adherent, hard, black eschar | 1 | 1 | 1 | 1 | 1 | 60% |
| 6. Necrotic tissue amount | 1=None visible | 5 | 4 | 3 | 1 | 1 | 80% |
| 2=<25% of wound bed covered | 4 | 3 | 1 | 1 | 1 | 72% |
| 3=25% to 50% of wound covered | 3 | 2 | 1 | 1 | 1 | 63% |
| 4=>50% and <75% of wound covered | 2 | 1 | 1 | 1 | 1 | 55% |
| 5=75% to 100% of wound covered | 1 | 1 | 1 | 1 | 1 | 47% |
| 7. Exudate type | 1=None | 5 | 3 | 3 | 1 | 1 | 80% |
| 2=Bloody | 4 | 3 | 1 | 1 | 1 | 70% |
| 3=Serosanguineous: thin, watery, pale red/pink | 3 | 2 | 1 | 1 | 1 | 63% |
| 4=Serous: thin, watery, clear | 2 | 1 | 1 | 1 | 1 | 54% |
| 5=Purulent: thin or thick, opaque, tan/yellow, with or without odor | 1 | 1 | 1 | 1 | 1 | 46% |
| 8. Exudate amount | 1=None, dry wound | 5 | 3 | 2 | 2 | 1 | 80% |
| 2=Scant, wound moist but no observable exudate | 3 | 2 | 1 | 1 | 1 | 63% |
| 3=Small | 2 | 1 | 1 | 1 | 1 | 54% |
| 4=Moderate | 1 | 1 | 1 | 1 | 1 | 46% |
| 5=Large | 1 | 1 | 1 | 1 | 1 | 40% |
| 9. Skin-colored wound surrounding | 1=Pink or normal for ethnic group | 5 | 3 | 2 | 2 | 1 | 80% |
| 2=Bright red &/or blanches to touch | 4 | 3 | 2 | 2 | 1 | 70% |
| 3=White or gray pallor or hypopigmented | 3 | 2 | 2 | 1 | 1 | 63% |
| 4=Dark red or purple &/or non-blanchable | 2 | 2 | 2 | 1 | 1 | 55% |
| 5=Black or hyperpigmented | 1 | 1 | 1 | 1 | 1 | 46% |

*Contd...*
Table 3: Contd...

| Item | 22/7/19 | 8/8/19 | 22/8/19 | 9/9/19 | 8/11/19 | 22/11/19 | Percentage decline |
|------|---------|--------|---------|--------|---------|----------|-------------------|
| 10. Peripheral tissue edema | 5 | 2 | 1 | 1 | 1 | 1 | 80% |
| 11. Peripheral tissue induration | 4 | 3 | 1 | 1 | 1 | 1 | 80% |
| 12. Granulation tissue | 5 | 3 | 3 | 2 | 2 | 1 | 80% |
| 13. Epithelialization | 5 | 4 | 4 | 4 | 2 | 1 | 80% |
| TOTAL SCORE | 59 | 40 | 30 | 24 | 18 | 15 | 75% |

Figure 1: Images of wound showing its condition during treatment and follow up. (a) Wound on the first day before treatment. (b) Wound during the first sitting of leech therapy. (c) The second sitting of leech therapy. (d) Third sitting at the time of Haridra dressing. (e) The wound on the day of discharge from hospital (1 month from the first day). (f) Wound during follow-up after 1 and a half months. (g) Wound during follow-up after 3 and a half months. (h) Significant hair growth over the surrounding skin.
strength), Raktaprasbadaka (blood purifier) and vrana sodhaka chikitsa (ulcerated wound treatment). Details of the medicines given for the management of the patient at different stages are well described in Tables 1 and 2. Few observations are worth to be discussed such as the use of Trivangabhasma (herbomineral preparation) in exudative/oozing ulcerative wounds has a very significant role in reducing the discharge. It was observed that the secretions from the wound were all together stopping after the use of Trivangabhasma for 1 week. Similarly, the use of Madhuyasti and Kutaki churna for the management of raised total leukocyte count showed highly significant improvement. Medicated ghrita was used for easy assimilation of medicines and also for restoration of natural strength to add substantial relief in symptoms. The use of medicated ghrita was a part of immunotherapy and its role in immunity was assessed on improvement in Oja and Dehabala. (based on Oja and Dehabala assessment proforma) Acharya Nasbhruta (Father of surgery and great ancient Indian physician) said that there is the presence of Krimi (microbes/pathogens) in all types of Kushttha and, therefore, Kriminashaka chikitsa (deworming treatment) was given after the suppression of discharge from the wound. Thus, at the first step, the treatment was aimed to restore the general health of the patient (nutritive and immunotherapy) and reduce the secretion from the ulcerated wound. The next step starts with the cessation of exudates from the wound with the aim to wipe out the secondary/superimposed infection and the third step concentrate on the healing of wound with proper granulation tissues with the help of Rasayana therapy. Use of Amala churna and Shirisha chaal (Albizia lebbeck bark powder) is for reducing oxidative stress to facilitate skin regeneration. Shirisha is said to be the best antitoxin medicine in Ayurveda and researches also establish that it has potent anti-allergic, anti-inflammatory, immunomodulator, and anti-oxidant properties. Kalamegha and Sudarshana churna were used to potentiate liver functions which were assumed to be impaired due to chronic use of medicines (contemporary as well as alternative). Both medicines have proven action on liver functions and are well-documented in research studies. Improvements in terms of symptoms as well as laboratory parameters were good enough to draw the attention of the scientific community and also for Ayurvedic practitioners to reciprocate the findings. Use of Jalauka (leech) is very beneficial in primary care of ulcerative wounds as it is easily available and it can be easily applied over the wound so it uproots the disease in the primary stage. Care should be taken that the patient should not have any bleeding disorder and leeches must be medicinal.

Conclusion

The presented combination of leech therapy and Ayurvedic medications is found to be a good alternative therapy in the management of nonhealing venous ulcers. Long-term prospective studies are required to substantiate the data.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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