



OPEN ACCESS

Volume: 5

Issue: 2

Month: April

Year: 2026

ISSN: 2583-7117

Published: 23.04.2026

Citation:

Dr. Malsoor Thirumala, Dr. K. Vanaja "Leech Therapy: An Old Method Applied in Modern Medicine" International Journal of Innovations in Science Engineering and Management, vol. 5, no. 2, 2026, pp. 112-115

DOI:

10.69968/ijsem.2026v5i2112-115



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Leech Therapy: An Old Method Applied in Modern Medicine

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Abstract

Leech therapy, also known as hirudotherapy, originated in ancient medicine when people used leeches for therapeutic purposes. Different cultures around the world have found these blood-draining, wormlike creatures since antiquity. In leech saliva, enzymes, peptides, and proteins such as anticoagulants, vasodilators, anti-inflammatory, and anaesthetic substances are present. Hirudin, an anticoagulant that prevents blood clotting, is the most important agent in leech saliva. In the 19th century, other bloodletting methods, whose origins date back even further than leech therapy, found their "application" in the "medicinal setting" of leech therapy. Consequently, "therapeutic bloodletting" gained popularity, particularly in Europe. However, plastic and reconstructive surgery, dermatology, and the management of pain/discomfort have been the primary areas where leech therapy has gained popularity in recent years. However, the historical limitations of leech therapy necessitate the performance of trained healthcare professionals.

Keywords; Leech therapy, Bloodletting, Pain management, Antithrombotic agents, Wound healing

INTRODUCTION

Hirudotherapy, or leech therapy, is an old healing method that uses leeches for medicinal reasons. For centuries, cultures worldwide have extensively utilized these leech-like parasites, primarily belonging to the class Hirudinea. Leeches contain in their salivary glands some enzymes, peptides, and proteins that have anticoagulant, vasodilatory, anti-inflammatory, and anesthetic properties, which naturally provide the possibility for healing. In the 19th century, leeches gained widespread popularity in Europe for their ability to cure various diseases through bloodletting. But, despite developments in modern medicine, leech therapy has recently experienced an uptick, especially in plastic and reconstructive surgery, dermatology, and pain management, among other specialties. Some medical conditions like venous congestion use leeches to increase blood flow, decrease swelling, and speed up healing. We begin the leech therapy process by placing the leeches on the damaged part, allowing them to feed on the patient's blood. The therapy's effects stem from the mechanical removal of congested blood and the presence of bioactive substances in the leech saliva. Conversely, healthcare professionals typically carry out leech therapy under their guidance.

- **Kingdom:** Animalia
- **Phylum:** Annelida
- **Class:** Clitellata
- **Subclass:** Hirudinea
- **Order:** Arhynchobdellida
- **Family:** Hirudinidae
- **Genus:** *Hirudinaria*
- **Species:** *manillensis*



Figure 1: Hirudinaria manillensis

Methodology

The leech therapy was conducted using a dual method.

Primary/Direct Method

We collected data from Sri. Dr. Chaitanya at the Panchakarma Ayurvedic Hospital located in Kamareddy district, Telangana state. (fig.1)



Figure 2: Collection of data from Dr. Chaitanya

Secondary/Indirect Method

Data collection from Kamareddy library with the help of librarian Laxmana Chary.



Figure 3: Collection of data from Librarian

Procedure of Leech Therapy

The procedure can be classified into 3 steps:

- Pre-Leeching
- Leeching
- Post-Leeching

Pre-leeching: it is divided into 2 types they are patient assessment, preparation of leeches.

Pre-leeching involves systematic preparation of the patient and the environment to ensure the effectiveness and safety of the therapy. This phase focuses on both the physical and psychological readiness of the patient and optimal conditions for leech application.

1 Patient Assessment:

Perform a comprehensive patient evaluation to ascertain the appropriateness of leech therapy and to identify any contraindications. Evaluate the patient's allergies, current medications, and medical history.

2 Informed Consent:

The objectives of leech treatment, its methodology, possible therapeutic benefits, and associated hazards, such as extended bleeding, infection, allergic responses, and mild pain. It also addresses the treatment plan's support, delineates the hazards, and offers a comprehensive description of the technique. The wording promotes patient inquiries and clarifies misunderstandings, enabling openness and comprehension of the operation.

3 Preparation of Leeches:

To maintain cleanliness, keep leeches in sterile, non-chlorinated water, ideally dechlorinated tap water or bottled spring water, and change it daily or every two days. Construct storage containers from glass or plastic, ensuring they have ventilation holes to prevent leeches from escaping. The use of sanitized instruments is crucial. Avoid using poisonous chemicals like alcohol, iodine, or detergents to prevent leeches from growing. Prior to treatment, wash them in fresh, sterile water and thereafter immerse them in a separate container filled with clean water for many hours. Administer leeches to satiate their hunger, thereby facilitating efficient blood extraction during therapy. Examine leeches for health and vigor, eliminating lethargic, impaired, or unfit specimens. Maintain leeches at a consistent temperature ranging from 15°C to 20°C, avoiding exposure to bright sunlight or cold temperatures. The objectives of leech treatment, its methodology, possible therapeutic benefits, and associated hazards, such as extended bleeding, infection, allergic responses, and mild pain. It also addresses the treatment plan's support, delineates the hazards, and offers a comprehensive description of the technique. The wording promotes patient

inquiries and clarifies misunderstandings, enabling openness and comprehension of the operation.



Figure 4: Preparation of leeches

Leeching: Before going for leeching, we should very actively involve.

We used active and healthy medicinal leeches from certified suppliers and kept them in lean, non-chlorinated water until application. We direct the leeches onto the intended treatment area during the leeching process. We use sterile forceps and hands (gloves) to guide the leech onto the skin of a patient. If there are any delicate areas, such as around the eyes or near surgical sites, you should use a small tube or place the leech inside a syringe to guide it to the specific site. If the treatment area is unsuitable for direct application due to infection or open wounds, you can place leeches on nearby healthy tissue to achieve the desired effect through blood flow.

Note: Avoid sensitive areas like mucosal tissues, such as lips or eyelids, large arteries or veins, to prevent excessive bleeding, and regions with active infections or necrosis.



Figure 5: During leeching process

Once placed, the leech uses its jaws to bite the skin, ensuring a secure attachment. Medicinal leeches release anticoagulants, i.e., hirudin, anti-inflammatory agents, and

anaesthetics to ensure painless feeding and therapeutic effects. Leeches typically consume 5–15 mL of blood over 20–60 minutes. Observe the leech behaviour to ensure it remains active and feeds effectively. After sufficient consumption of blood, leeches usually detach naturally.

If you need to remove the leech, apply saline, alcohol, or vinegar near its mouth to encourage detachment. Never forcefully pull the leech, as this can damage the tissue and increase infection risks.

Post- leeching: After completion of leeching process, the processes are

1 Control of bleed.

Bleeding control is a critical aspect of post-leeching care. Medicinal leeches (*Hirudo medicinalis*) introduce anticoagulants like **hirudin** and **calin** into the bloodstream, prolonging the bleeding from bite wounds for up to 24 hours or more. While this oozing is often therapeutic, as it aids in drainage and detoxification, proper management is necessary to prevent excessive blood loss or secondary complications.

- **Clear the wound:** Use sterile saline or an antiseptic solution (e.g., povidone-iodine) to clean the bite site. Avoid vigorous scrubbing to prevent irritation or reopening of the wound.
- **Pressure Application:** Gently press a sterile gauze pad over the bite site to manage initial bleeding. Hold for 3–5 minutes or until the oozing slows down.
- **Dressing the wound:** Apply a sterile dressing to cover the bite site. Use an absorbent material such as a gauze pad for wounds with ongoing oozing.
- **Duration of Bleeding:** Bleeding usually persists for 8–24 hours, depending on the individual's coagulation profile and the number of leeches applied.
- **Post-Bleeding Healing:** Once bleeding stops, allow the wound to heal naturally. Avoid applying ointments or creams that may hinder clot formation or attract contaminants. Healing typically occurs within 7–10 days, leaving minimal scarring.

2. Control and Care of Leeches.

After completing a session of leech therapy (*hirudotherapy*), it is essential to handle the used leeches properly to ensure safety, maintain hygiene, and adhere to ethical and legal guidelines. Medicinal leeches are single-use in medical practices to prevent cross-contamination and the spread of infections.

- **Rinsing:** Rinse the leeches in fresh water to remove residual blood from their external surface. This reduces contamination and ensures easier handling.
- **Containment:** Transfer the leeches to a secure container filled with clean water. The container should be well-ventilated to prevent suffocation. Cover it with a mesh or perforated lid to prevent escape. Label the container as “Used Leeches” for proper identification.

RESULTS

Leech therapy has shown significant therapeutic benefits in a variety of areas.

1 Improved Blood Circulation:

The anticoagulant effects of hirudin facilitated smoother blood flow, particularly in areas of venous congestion. Patients with localized swelling or circulatory impairments showed marked improvement.

2 Reduction in Pain and Inflammation:

Anti-inflammatory agents in leech saliva reduced swelling and discomfort in the treatment areas. Patients reported decreased reliance on pain medications post-treatment.

3 Toxin and Stagnant Blood Drainage:

Therapeutic bleeding helped eliminate toxins and deoxygenated blood, promoting tissue recovery.

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