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Original Article

"Clinical study of leech application in various medico-surgical conditions"

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ARTICLE INFO

Article history:
Received 18 April 2014
Accepted 14 June 2014
Available online 9 July 2014

Keywords:
Anti-inflammatory
Bloodletting
Hirudo medicinalis
Leeches
Medico-surgical conditions

ABSTRACT

Introduction: The study evaluates the effectiveness of medicinal leech (*Hirudo medicinalis*) therapy in a population of 150 patients having various medico-surgical conditions to treat diseases like varicose veins, varicose ulcers, perianal haematoma, skin diseases (such as eczema, herpes zoster), inflamed or thrombosed piles and other inflammatory conditions including gangrene and traumatic inflammation.

Methods: The assessment score was recorded on various parameters namely – pain, tenderness, swelling, redness, local temperature, stiffness, *Kandu* (itching), slough, *srava*, *daha* (burning sensation), *tvakrukshata* (dryness of skin), granulation tissue, assessment of base/floor and wound size. Wilcoxan Signed Rank test was used to compare the pre and post leech application score.

Result: The study clearly indicated significant reduction in severity of pain, burning sensation, itching swelling among the patients. The mean pO_2 of blood (40.05) sucked by leeches was found to be almost equal to that of venous blood of the patient (34.55).

Conclusion: Leech sucked venous blood contributes to reduction in severity of symptoms. The study recommends the therapy to be used as a para-surgical therapy in the management of various medico-surgical conditions mentioned above.

1. Introduction

Leeches have been used for medicinal purpose since the era of Ayurvedic medicine dating back to 2000 BC. Leech application is one of the methods of bloodletting used by the ancient physicians and surgeons. Through bloodletting, it was thought that leeches would drain "impure blood" from the body, thereby curing illness. Leech therapy was an established treatment for haematomas, boils, abscesses etc. in the old Indian medicine. The pioneer of this therapy is *Aacharya Sushruta* (2000 BC). He has elaborated leech application (*Jalaukavacharana*) under the topic of bloodletting (*Raktamokshana*).[1] Similar treatment was also described as early as 200 BC for mental illness and headaches as reported by Adams and Lassen.[2]

The leech therapy is not only confined to India. It has now become popular in foreign countries as well. Leech is widely used in post-operative complications where blackish & bluish discolouration of skin occurs due to impairment of blood circulation.[3] In 1985, at Harvard University, one of the physicians was having great difficulty in reattaching the ear of 5 years old child; the tiny veins kept clotting. Use of leeches saved the

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http://dx.doi.org/10.1016/j.cmrp.2014.06.009

ear.[4] When leeches being fed, they inject salivary component that inhibit both the platelet aggregation and the coagulation cascade, thus, releasing the venous congestion and induces neo-vascularisation.[3] Due to this property leeches are being widely used in post-operative complications after skin grafts. Leeches suck the surplus blood free of veins to reconnect naturally, thereby, restoring the blood circulation. Leeches secrete Hirudin (haematin) in its saliva which has anti-coagulant property that prevents blood clotting. Due to this property they improve macro & microcirculation and clearing blockage. Leeches inject powerful anaesthetic & anti-inflammatory enzymes while sucking the blood and patient feels no pain. Hirudin has a powerful blood thinner which break-up pooled blood for better extraction from the affected part.[5] BBC NEWS published on 2nd July, 2004 says, "In a world where medical advances are dominated by developments in drugs and surgery it seems that in certain fields these humble creatures cannot be beaten. They are highly prized as a tool for healing skin grafts or restoring circulation, especially in reconstructive surgery". Recently in some western countries, plastic surgeons have tried leech therapy to increase the possibility of take of the grafts.[6,7] The rationale for such use has been that greater capillary perfusion and hence better tissue healing occurs due to decreased venous congestion and oedema following bloodletting by leech therapy.

The present study primarily aims at evaluating anti-inflammatory, pain relieving results, improvement in blood circulation by LEECH application in various medico-surgical conditions in addition to its cost effectiveness.

2. Materials and methods

Clinical study was carried out over a period of 2 years on 150 patients in Govt. Ayurveda Medical College with the approval of Institutional Ethical Committee on dated 17-9-2011.

2.1. *Inclusion criteria*

i. Patients of both the sexes between the age of 12–60 years
ii. Patients with medico-surgical conditions such as varicose veins, varicose ulcers, perianal haematoma, skin diseases (such as eczema, herpes zoster), inflamed or thrombosed piles and other inflammatory conditions including gangrene

2.2. *Exclusion criteria*

i. At the time of baseline assessment, a profile of haemogram, biochemical investigations and serological tests for HIV, HBsAg and VDRL was obtained. Patients with HIV I/II, HBsAg, VDRL infections were excluded from the study

2.3. *Method of leech application*

Medicinal leeches (*Hirudo medicinalis*) were collected from the storage tank at surgical ward of research hospital. Leeches were kept starved for five days. Turmeric powder was applied to the mouth of leech to make them active. The leeches were applied to the affected area of patient. The number of leeches applied depends on the area of the affected part and the number of sites affected. They were applied once in a week or earlier as per need. The duration of leech application was dependent on size of leech and the speed of sucking the blood which varied from 10 to 45 min. The number of leeches applied during each session ranged from 1 to 4 and the number sessions required per patient ranged from 2 to 8, depending on the type of disease, severity and the site of disease. The applications were carried out until the patient gets significant relief in major symptoms (Table 1).

Each leech sucked on an average 20–30 ml of blood, with a further mild oozing occurring for 3–4 h after the leech fell off. Blood was obtained from coelomic cavity of leech within 5 min of its attachment and analysed for pO_2 using the ABL 80 analyser (Instrumentation). This aspect of study was carried out in the selected 10 patients of the trial. The results were analysed using the paired *t*-test. The patients were assessed various parameters and the score was recorded on the efficiently designed case record form according to the standard degrees of respective parameter. The results were analysed using Wilcoxan Signed Rank Test.

2.4. *Assessment criteria*

The data was recorded on the following clinical parameters:

1. Pain: Recorded on an internationally accepted pain mobility gradation chart (based on Visual Analogue Scale)

	VAS score
Grade 0 – No pain	0
Grade 1 – Mild pain	1–3
Grade 2 – Moderate pain	4–7
Grade 3 – Severe pain	8–10

2. Tenderness
   - Grade 0 – No tenderness
   - Grade 1 – Mild
   - Grade 2 – Moderate
   - Grade 3 – Severe
3. Swelling
   - Grade 0 – No swelling
   - Grade 1 – Mild
   - Grade 2 – Moderate
   - Grade 3 – Severe
4. Redness
   - Grade 0 – No swelling
   - Grade 1 – Mild
   - Grade 2 – Moderate
   - Grade 3 – Severe
5. Local temperature
   - Grade 0 – No swelling
   - Grade 1 – Mild
   - Grade 2 – Moderate
   - Grade 3 – Severe