Research Article

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ROLE OF BILWADI AGADA IN THE MANAGEMENT OF SCORPION STING

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ABSTRACT

Scorpion sting is a particularly devastating and an endemic public health problem in some part of the India. 50 species out of 700 in India can cause serious illness. Most of the studies have focused on the clinical and epidemiological aspects of scorpion stings. Ayurveda has explained numerous medicinal preparations for the management of Vrishchika Damsha (Scorpion sting) but so far very little statistical data is available regarding the efficacy of these medicines particularly in the management of pain. This Paper is focused on efficacy of one of such preparations, Bilwadi Agada which was a part of research for internal medications. A clinical study was conducted in 2005 at Pappinissery Visha Chikitsa Kendra, Kannur. Total 10 subjects suffering from Scorpion sting satisfying inclusion criteria were selected and after obtaining consent, treated with Bilwadi Agada for 4 days. Thorough clinical assessment was done before and after the treatment. The result was analyzed statistically with paired t-test which was found highly significant in reducing the cardinal symptom, pain, erythema and inflammation in scorpion sting ($P < 0.001$). Drug also proved effective in reducing other associated symptoms like burning sensation and itching sensations in Scorpion sting

Key words: Scorpion sting, Pain, Bilwadi Agada, Ayurveda, Mesobuthus, Anti venom.

INTRODUCTION

Scorpion sting is a particularly devastating and an endemic public health problem in several developing countries. Most lethal Scorpions are confined to Thane, Raigad and Ratnagiri districts of Maharashtra, Rayalaseema in Andhra Pradesh, Bellary in Karnataka, Chennai and Madurai in Tamilnadu in India. Scorpion stings are endemic in tropical and subtropical regions.¹ Approximately 1,500 species of the Scorpion are found worldwide. Commonest species found in south India are *Mesobuthus tamulus* in houses, *Palamaneus swammerdami*, *Buthus landersoni* on coconut and palm trees, *Lychas* and *Isometrus* species.² Scorpions are venomous arthropods that belong to the class Arachnida.³ There are 50 species out of 700, in India, which can cause serious illness.¹ The estimated annual number of scorpion stings is 1.2 million leading to 3250 deaths.⁴ Although a variety of different scorpion species exist, majority of them produce similar cardiovascular effects. Severe pain at the site of sting, erythema, swelling, vomiting, local urticaria, and severe burning sensation are other common signs and symptoms. It can also result in multi-organ system failure leading to death. It is stated that for every person killed by a poisonous snake, 10 are killed by poisonous scorpions.¹ Few studies have been focused on patho-physiology of scorpion envenomation by critical observations of clinical, neurotransmitters studies, radioisotope studies, echocardiography and haemodynamic patterns. Common sites of the sting are extremities and during hot season i.e. June to October. Though most of the studies have focused on the clinical and epidemiological aspects of scorpion stings, the first and foremost sensation which can be felt by a person is severe unbearable pain with burning sensation. In case of

scorpion sting, it has been stated that severe the pain, less venomous the scorpion and better the prognosis and vice versa.¹ In Ayurveda, Vrishchika are considered as one of the Kita possessing the property to produce fatal signs and symptoms, and have been explained under the context of Kita Visha Pratishedha by all the sages. But it can produce more fatal symptoms as compared to other Kitas. So it is no wonder that Ayurveda tried to classify these Vrishchika according to its potency to produce fatality.^{5,6,7}

Need of the study

Extreme local as well as radiating pain with erythema and inflammation are the most common symptoms found in case of Scorpion sting, which may persist for more than 72 hours.⁸ It may also effect on mood, functional status, and quality of life and so be associated with increased health service use.^{9,10}

Ayurveda has explained numerous medicinal preparations; both external as well as internal for the management of Vrishchika Damsha but so far very little statistical data is available regarding the efficacy of these medicines as far as the pain is concerned although few studies suggest the anti-venom effect of certain medicinal plants in the conditions of envenomation.¹¹ This study was an effort to find out the efficacy of one of such preparations 'Bilwadi Agada' (A.H.U. 36/85) in the management of Scorpion sting. Two more symptoms which are commonly found in Scorpion sting are local burning sensation and Itching sensation. Effect of this preparation on these two symptoms was also evaluated after applying proper grading criteria.

MATERIALS AND METHODS

A randomized clinical trial was conducted from July to September of 2005 in Pappinissery Visha Chikitsa Kendra, Kannur. This paper highlights only the effect of Bilwadi Agada which was the part of therapy given in one of the groups. Total 10 subjects suffering from Scorpion sting satisfying inclusion criteria were selected and after obtaining consent they were treated with Bilwadi Agada in a dose of 1 g b.i.d. after food. Ordinal grading scale was done to score the intensity of the cardinal symptoms pain, Erythema, inflammation, burning sensation and itching sensation.

Drug Profile

Ingredients of Bilwadi Agada: (A.H.U. 36 / 85)

1. Bilva (moola) - *Aegle marmelos* Corr
2. Surasa (pushpa) - *Ocimum sanctum* Linn.
3. Karanja (phala) - *Pongamia pinnata* Perri.
4. Tagara - *Valeriana wallichii* DC
5. Devadaru - *Cedrus deodara* Roxb.
6. Haritaki - *Terminalia chebula* Retz.
7. Vibhitaki - *Terminalia bellirica* Roxb.

8. Amalaki - *Emblca officinalis* Gaertn
 9. Shunthi - *Zingiber officinale* Rosc.
 10. Maricha - *Piper nigrum* Linn.
 11. Pippali - *Piper longum* Linn.
 12. Haridra - *Curcuma longa* Linn.
 13. Daruharidra - *Berberis aristata* DC.
- Bhavana (trituration) with Aja mutra (Goat's Urine)

Inclusion Criteria

- Subjects irrespective of sex, caste and religion with age between 15 to 65 years.
- Subjects suffered from scorpion sting with duration not more than 48 hours.
- Patients with cardinal symptom pain, erythema and Inflammation due to scorpion sting.

Exclusion Criteria

- Subjects with severe systemic manifestation due to scorpion sting.
- Patients who have already undergone for any other treatment for pain.
- Patients who are not in position to give consent.

Table 1: Effect of Bilwadi Agada in Pain

BT (n=10)	AT	M. diff.	% of Relief	SD	SEM	't' value	P value
3.1	0.6	2.5	80.64	0.7	0.221	11.36	P < 0.001

Table 2: Effect of Bilwadi Agada in Erythema

BT (n=10)	AT	M. diff.	% of Relief	SD	SEM	't' value	P value
1.9	0.2	1.7	89.47	0.482	0.1524	11.18	P<0.001

Table 3: Effect of Bilwadi Agada in Inflammation

BT (n=10)	AT	M. diff.	% of Relief	SD	SEM	't' value	P value
2.4	0.4	2	83.33	0.812	0.257	7.81	P<0.001

Table 4: Effect of Bilwadi Agada in Burning Sensation

BT (n=10)	AT	M. diff.	% of Relief	SD	SEM	't' value	P value
3.5	0.2	3.3	94.28	0.482	0.152	21.71	P<0.001

Table 5: Effect of Bilwadi Agada in Itching Sensation

BT (n=08)	AT	M. diff.	% of Relief	SD	SEM	't' value	P value
2.87	1.37	1.5	52.17	0.529	0.187	8.33	P<0.001

Table 6: Percentage of relief obtained in specific Dosha

Dosha	BT	AT	% of Relief
Vaata-Pittaja (n=5)	12.6	2.6	79.36
Pitta-Kaphaja (n=2)	14.5	3	79.31
Kapha-Vaataja (n=3)	13.33	2	84.99

Effect of the Drug – Bilwadi Agada **% of Relief in Dosha Predominance**

RESULTS

Observations were made before and after completion of treatment. Ordinal numerical rating scale was utilized for the assessment of pain, burning sensation and itching while erythema, inflammation, was assessed by specially developed scales. Study showed following results-

Table 1 shows that mean score of 10 subjects for the Pain before the start of the treatment were 3.1 which reduced to 0.6 after 4 days. Mean Difference was 2.5 ± 0.7 . Percentage of relief obtained was 80.64%. Statistically the result was found to be highly significant ($P < 0.001$).

Table 2 shows that Mean score of Erythema of 10 subjects was reduced from 1.9 to 0.2. Mean difference was 1.7 ± 0.482 . Percentage of relief obtained was 89.47% which was statistically highly significant ($P < 0.001$).

Inflammation was found in 10 subjects (Table 3), where mean score was reduced from 2.4 to 0.4 with mean difference of 2 ± 0.812 . Percentage of relief obtained was 83.33%. In this case also result was found statistically significant ($P < 0.001$).

Table 4 shows the effect of the treatment on burning sensation. The mean score for the burning sensation before the treatment was 3.5, which was later, reduced to 0.2 after the completion of the treatment. Mean difference was 3.3 with SD of ± 0.482 . Percentage of relief obtained was 94.28%. 't' value was found 21.71 which was highly significant ($P < 0.001$).

Table 5 shows that the mean score for the itching sensation was present at the site of sting in 8 subjects. The score was reduced from 2.87 to 1.37 with mean difference 1.5 and SD of ± 0.529 . Percentage of relief obtained was 52.17%. 't' value and was found to be 8.33 which was also statistically significant ($P < 0.001$).

Table 6 shows percentage of relief obtained in specific dosha condition. In Vaata-Pittaja condition, total mean score was reduced from 12.6 to 2.6 giving 79.36 % of relief (n=5) In Pitta-Kaphaja condition percentage of relief obtained was 79.31% (n=2). In Kapha-Vaataja predominant condition total mean score was reduced from 13.33 to 2 with 84.99% of relief (n=3).

DISCUSSION

Treatment of scorpion envenoming in humans is a difficult problem as current patho-physiological and biochemical knowledge of scorpion envenoming is scarce.¹² The conventional treatment prescribed for the management of pain in scorpion sting was to administer of local anesthetics which may sometimes results in producing adverse reactions.^{13,14} General Management of Vrishchika Damsha mentioned in classical Ayurvedic texts can be divided in two major elements, Daivavyapashraya and Yukti vyapashraya Chikitsa.^{15,16,17} In the present clinical trial, effect of Bilwadi Agada was evaluated on three cardinal signs and symptoms of Scorpion sting cases. Proportionate distribution of all the properties in Bilwadi Agada shows that 85.71% drugs are having Ushna Veerya, among them 68.28% are Vaataghna and 78.57% are Kaphaghna. By these properties the Drug Bilwadi Agada may give relief in pain as well as in swelling. It contains Nata (*Valeriana wallichii* DC), which is considered as a Vishghna Drug. A

drug like Bilwa (*Aegle marmalose* Corr.) is a proven anti-inflammatory drug.¹⁸ By virtue of its Ushna Virya, Katu Vipaka and Kashaya, Tikta rasa it is Kapha Vata shamana and is suitable for the treatment of pain and swelling. Pippali (*Piper longum*) is also having the properties like anti-allergic,¹⁹ Anti pyretic,²⁰ Analgesic,²⁰ and Anti-inflammatory.²⁰

It also contains Haritaki (*Terminalia chebula*) that brings Anuloma gati of Vayu, which is a prime mode of action for the breakage of Samprapti of Shotha and Vedana. Another content Tulasi (*Ocimum sanctum* linn) is having Anti-inflammatory,²¹ Analgesic and Anti-pyretic, immuno regulatory action.²² It also acts as Anti-histaminic and Anti bacterial²³ the drug is also proved for its anti-toxic effect.²⁴

Bilwadi Agada contents 7.14% Sheeta and Anushnasheeta Veerya dravya, which may act as Pittaghna. 21.42% are with Madhura rasa and 28.57% are Tridoshaghna. All these properties may help to reduce the Erythema as well as burning sensation due the Scorpion sting. Drugs like Haridra (*Curcuma longa* Linn), Daruharidra (*Berberis aristata* DC) and Karanja (*Pongamia pinnata* Perri) are very useful in itching conditions. Haridra (*Curcuma longa* Linn) also acts as Anti-inflammatory drug.

Goals of the therapy

- Decreased the frequency and / or severity of the pain.
- Induced general sense of well being.
- Increased level of activity, return to work.
- Decreased health care utilization.
- Elimination or reduction in medication usage.

Limitations and Recommendations

- Pain is a Subjective feeling, precision of intensity is difficult to generalize.
- In certain cases myocardial involvement is also possible. Such cases may require further interventions accordingly.
- Medicinal Plants with anti-venom properties may also be prescribed internally for better results.
- Present study was conducted with ordinal grading scale. Hence grading scale may be précised for further studies.

CONCLUSION

In present study, Bilwadi Agada showed astonishing results in relieving the pain in case of scorpion sting. The treatment was found to be cost effective, easily procurable and less hazardous as compared to conventional local anesthetic drugs. Further studies can be conducted on larger samples along with other internal medications on specific species of Scorpion and in specific season to precise as well as to improve the final outcome.

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