

Brief Communication

Efficacy of Saptaparna Leaf and Stem Latex on Krumidanta Shool (Pain Due to Dental Caries): A Randomized Comparative Open Placebo Controlled Clinical Trial

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Abstract

Krumidanta (Dental caries) is one of the most common dental disorders all over the world. It affects children as well as adult, prevalence and severity varies in different population. There is pain as an associated symptom which many a times is unbearable. The pain associated with it is most annoying. The treatment given is antibiotics and analgesics which may give side effects. So an herbal drug is desirable which is safe and economical. Saptaparna (*Alstonia scholaris* LinnR.br) is one such drug recommended in the classics whose latex is said to be effective on Krumidanta shool (pain due to dental caries), hence there is need to evaluate uses of Saptaparna latex on Krumidanta. A clinical trial carried to see the effect of Saptaparna latex on dentolgia has shown it as being effective and safe.

Keywords: *Alstonia Scholaris*; Caries; Krumidanta; Latex; Saptaparna.

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Introduction

Dental caries is a microbial disease of the calcified tissue of the teeth characterized by demineralization of the inorganic portion and destruction of the organic substance of teeth.¹ It is vividly mentioned in Ayurvedic texts as “Krumidanta” (dental caries), one of the “mukha rogas” (oral disease)² which is most prevalent, chronic disease affecting the human race. There is practically no geographic area in the world, whose inhabitants do not exhibit some evidence of dental caries.³ References are available in ancient Indian traditional medicine books like *Ashtang hridaya*⁴ and *Chakradatta*⁵, about uses of Saptaparna in krumidanta shool (pain) and it is clearly stated that latex of Saptaparna should be used to give dressing to the cavity of krumidanta (dental caries) to reduce the pain. Saptaparna known as *Alstonia scholaris* (Linn) R.Br botanically has group of seven leaves on each branch. It belongs to family Apocynaceae (karavir kul).^{6,7} Though demineralization and destruction of the affected tooth cannot be controlled, the severe pain can be taken care of by the latex of Saptaparna (*Alstonia scholaris* (Linn) R.Br). The increasing popularity of natural and herbal resources is because they are safe, efficient and economic. The need of the present time is development of appropriate strategies, and these strategies demand that the theories and principles of Ayurveda be popularized, and make Ayurveda available to the world

community for its benefit. Purpose of study is to make Ayurveda available as not more drugs for pain due to dental caries are available.

Materials and Methods

An open placebo controlled comparative randomized clinical trial was carried out in Dental unit. The experimental group was drawn from the population attending the outpatient department of the K.L.E Societies College Ayurved and Post graduate Institute Khasbag Belgaum, India, Dental unit. Ethical Committee clearance was obtained from the Institute; written consent of the patients was also obtained during the study. Random sampling procedure was followed and the study group was divided into three groups. Each groups comprised of 30 subjects. The patients were clinically diagnosed; thorough dental history of the patients was recorded before the clinical trial was started. The groups were made irrespective of age and sex. Only cases having dental caries with pain were selected. Their pain was measured on a visual analogue scale.⁸ Preparation of plant material latex of *Alstonia scholaris* (R br) was obtained from Institute’s pharmacy.

Inclusion criteria endure permanent dentition of adults having vital teeth with occlusal caries lesion. Exclusion criteria endure deciduous dentition of anterior teeth having non vital teeth.

Criteria for assessment of pain⁸: The pain was assessed on visual analogue scale (VAS), A VAS consists of a 10 cm line on which '0'cm is no pain and 10cm is "pain as bad as it could be". The patient marked the point along the line that best represents his or her pain, and the score was measured from no pain end of the scale as no pain, mild, moderate and severe pain.

Group A: All the subjects in this group were treated with the latex of Saptaparna (*Alstonia scholaris*, Linn R br) leaf. The caries were clinically diagnosed and the cavity was then filled with cotton plugate soaked in the latex of the leaves. They were also instructed to remove the swab after 10 min and not to have any analgesics and antibiotics when under treatment. No restriction on diet was put during trial. The patients were called for follow up daily up to four days.

Group B: All subjects of this group were treated with the latex of Saptaparna bark the procedure being same as Group A. pain evaluation was also same as Group A.

Group C: This was placebo (distilled water) group. The procedure instructions were same as Group A and B. The assessment of pain was also similar to Group A and B.

The statistical method used in the present study for comparison of three groups was by student 't' test.

Results

After four days of treatment it was observed that the control of pain with the trial drug was very good compared to the results of the placebo group, most of the patients got complete and a few got partial reliefs from pain. Not a single patient complained of any side effects. The incidence of caries was observed more in females than in males and was more in people from rural area compared to semi urban area. All age group irrespective of community had same

prevalence of caries and was more in vegetarians than in non-vegetarians. Oral hygiene was poor amongst all the patients.

Group A: The average pain on 1st day was 6.19 with SD of 1.64. The average pain on 2nd day was 2.65 with SD 1.36 which was significantly less compared to the average pain of 1st day ($P=1.08 \times 10^{-16}$). Average pain on 3rd day was 0.85 with SD 1.16 which was significantly smaller compared to the average pain of 2nd day ($P=2 \times 10^{-12}$). The average pain on 4th day was 0.27 with SD=0.53 which was statistically smaller than the average pain of previous day ($P=1 \times 10^{-3}$).

Group B: The average pain on 1st day was 6.11 with SD 1.81. The average pain on 2nd day was 2.23 with SD 1.68 which was significantly less compared to the average pain on 1st day ($P=1.33 \times 10^{-17}$). Average pain on 3rd day was 0.42 with SD 0.76 which was significantly smaller compared to the average pain of 2nd day ($p=1.4 \times 10^{-7}$).

Group C: Average pain on 1st day was 5.62 with SD=1.69, 2nd day was 5.34 with SD=1.69 ($P=8.2 \times 10^{-3}$), 3rd day was 4.65 with SD = 1.85 ($P=3 \times 10^{-4}$) and 4th day was 3.84 with SD=2.32 ($P=2 \times 10^{-4}$)

Out of 90 subjects 78 were evaluated at 2nd, 3rd, 5th day to assess the pain score in dental caries. Twelve subject approximately four from each group, who did not complete the study, did so for reasons unrelated to the use of test materials. Inter group comparison done between A & B shows that average levels of pain were found to be almost same in group A & B. comparison between B & C showed highly significant difference in average pain levels between these two groups. Group A & C showed highly significant levels in pain on 2nd, 3rd and 4th day. This shows that the bark latex and the leaf latex were equally effective and latex treatment proved effective compared to the placebo group.

	Group A				Group B				Group C			
	Day1	Day2	Day3	Day4	Day1	Day2	Day3	Day4	Day1	Day2	Day3	Day4
N	26	26	26	26	26	26	26	26	26	26	26	26
Mean	6.19	2.65	0.84	0.26	6.11	2.23	0.42	0.11	5.61	5.34	4.65	3.84
S.D	1.64	1.35	1.15	0.53	1.81	1.98	0.75	0.32	1.69	1.69	1.85	2.32

Table 1: Mean and standard deviation of groups A B & C for all 4 days

Discussion

Dental caries results from complex interaction among three factors: Host, microflora and substrate (diet).³ According to Ayurveda Saptaparna is described in many of the Samhita (Classical texts of Ayurveda)

as 'Shoolgana' (analgesic) 'Krumighna' (anti-bacterial) and 'Vranahara' (wound healing). *Alstonia scholaris* (Linn. R.br) contains alkaloids like echitamine, alstonamine, scholarine, picrinine, strictamine, ditamine, vallesamine and scholaricin and anti-

inflammatory, analgesic activity.⁹ also its antibacterial activity has been reported.^{10,11} Hence the present study was planned with prime objective of evolving an effective analgesic drug, its effect on pain was evaluated on dental caries, scientifically within the limit of available facilities. Though similar studies were not recorded i.e its effect on pain due to dental caries) the analgesic activity is been proved⁹ already.

Group	Day	P values	Significance
Group A & B	1	0.873	Not significant
Group B & C		0.310	Not significant
Group A & C		0,219	Not significant
Group A & B	2	0.322	Not significant
Group B & C		2.1×10^{-08}	Highly significant
Group A & C		6.8×10^{-08}	Highly significant
Group A & B	3	0.124	Not significant
Group B & C		1.2×10^{-14}	Highly significant
Group A & C		7.2×10^{-12}	Highly significant
Group A & B	4	0.215	Not significant
Group B & C		1.3×10^{-10}	Highly significant
Group A & C		6.9×10^{-10}	Highly significant

Table 2: Inter group comparison (Unpaired 't' test)

Conclusion

Saptaparna is anti-inflammatory and analgesic. As per Ayurveda it is shoolaghna (analgesic) hence is capable of bringing down the pain, it is also said to be 'vataghna' (Vata is the humor which is responsible for all kinds of pain), the pain due to dental caries was due to predominance of 'Vata', Alstonia scholaris contains alkaloids like, picrinine, vallesamine and scholaricine which may produce anti-inflammatory and analgesic action because of these ingredients.⁹ Hence we can conclude that the drug latex of Saptaparna can be effectively used for the management of pain in caries without any adverse effects. Over all analysis of the data shows leaf and bark latex was almost found to be equally

effective. The latex treatment was definitely proved to be effective on pain due to dental caries.

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