Clinical Research

A clinical study on *Krimidanta* with reference to dental caries and its management with *Jatipatradi Gutika* and *Yavanadi Churna*

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Abstract

Dental caries is progressive destruction of enamel, dentine and cementum, initiated by microbial activity at the tooth surface. It is one of the major problems in dentistry. On the basis of clinical features, it can be compared with *Krimidanta* which is one among the eight diseases of tooth. In the management of *Krimidanta, Krimighna, Vataghna* and *Ushna Veerya dravyas* are to be used which can relieve the toothache and discoloration. In this study, the trial drugs used were *Jatipatradi Gutika* for *Pratisarana* and *Yavanadi Churna* for oral administration. In this study, the patients of *Krimidanta* (dental caries) were selected from OPD of Shalakya Department and allotted randomly in different groups. In Group A, the patients were treated with *Jatipatradi Gutika* for *Pratisarana* for 30 days. In Group B, the patients were treated with *Yavanadi Churna* orally and Group C patients were treated with combined therapy for 30 days. The clinical study has shown that combined therapy gives better results than individual therapies.

Key words: Dental caries, Jatiptradi Gutika, Krimidanta, Pratisarana, Yavanadi Churna

Introduction

Teeth are very precious organs of the body, governing lot of functions like chewing, speech control, giving shape to the mouth and the most important of all is to maintain the beauty of the face; once they are destroyed, they cannot regrow.^[1] Eight *Danta Rogas* are described by *Acharya Sushruta*; of them, *Krimidanta* is the one which gradually results in tooth loss, if not treated in time.

Krimidanta is characterized by black discoloration, cavity formation, swelling, pus and blood oozing and severe pain.^[2] It occurs due to vitiation of *Vata* followed by *Pitta* and *Kapha Dosha*.

Dental caries often leads to fatal infection and may lead to death, if the patients do not take proper treatment.^[3] Oral infections in patients with rheumatic or congenital heart diseases are particularly dangerous, as they can lead to the risk of infective endocarditis.^[4]

Knutson's technique is widely recommended for topical application of sodium fluoride to the teeth. The effectiveness of topical fluoride administration is questioned.^[5] An operative procedure such as filling and R.C.T. techniques have their own limitations. As

Address for correspondence: Dr. Manjusha Rajagopala, Associate Professor, Shalakya Department, I.P.G.T. & R.A., Jamnagar - 361008. Email: bhatrajma2008@gmail.com DOI: 10.4103/0974-8520.72404 per the World Health Organization (WHO) technical report 1995, 19 billion individuals per year are affected by dental caries; thus, this disease poses a challenge to the dentists. All these facts leave a scope to search a better remedy to the problem.

In Ayurvedic texts, a good number of medicaments are explained for strengthening the teeth and gums. These remedies are made from various plants and applied to the gums and tooth in the form of powders, oils, etc. In addition to this, bloodletting is also described in classics. In the management of *Krimidanta*, the drugs having *Krimighna* (antimicrobial), *Vranaghna* and *Ushna Veerya* are to be used which can relieve the toothache and *Krimi*. In the present study, the trial drugs used were *Jatipatradi Gutika* for *Pratisarana* and *Yavanadi Churna* (Bhaishajya Ratnavali 61/99, 30/11)^[6] for oral administration.

Aims and objectives

The present study was based on following aims and objectives.

- 1. To study the etiopathogenesis of *Krimidanta* (dental caries) from Ayurvedic and modern points of view.
- 2. To evaluate the efficacy of *Jatipatradi Gutika* and *Yavanadi Churna* in signs and symptoms of *Krimidanta* (dental caries).

Materials and Methods

Source of data

In the clinical trial of *Krimidanta* (dental caries), the patients were selected from OPD and IPD of Shalakya Tantra department, IPGT and RA hospital, Jamnagar and were randomly assigned into three groups, viz., Groups A, B and C. A total of 40 patients were registered and randomly distributed in three groups, comprising 14 patients each in Groups A and C and 12 patients in Group B.

Inclusion criteria

The patients were diagnosed on the basis of the signs and symptoms of *Krimidanta* (dental caries) and these patients were included in the clinical study.

Exclusion criteria

Patients with the following were excluded:

- age below 10 years and above 60 years,
- fractured tooth,
- patients with periodontal abscess and
- patients with other diseases of oral cavity.

Ethical clearance

The study was cleared by the ethical committee of the institute. Written consent was taken from each patient willing to participate, before the start of the study. For those patients who were unable to read or write, consent of their relatives was taken. Patients were free to withdraw their names from the study at any time without giving any reason.

Jatipatradi Gutika and Yavanadi Churna preparation

"Jatipatradi Gutika" and "Yavanadi Churna" were prepared according to the standard method of preparation of Gutika and Churna, respectively, in the pharmacy of Gujarat Ayurved University. The Ingredients of Jatipatradi Gutika are Jatipatra (Jasminum grandiflorum), Ajamoda (Carum Roxburghianum), Shunthi (Zingiber officinale), Punarnava (Boerhavia diffusa), Musta (Cyprus rotundas), Hareetaki (Terminalia Chebula), Jhintipatra (Barleria prionitis), Vacha (Acorus calamus), and Tila (Sesamum indicum). Yavanadi Churna consists of five drugs, viz., Yavani (Trachispermum ammi), Hareetaki (T. Chebula), Hingu (Ferula Foetida), Saindhava (sodii chloridum impura) and Sauvarchala (Unaqua sodium).^[7,8]

Assessment criteria

An assessment was made on the basis of change in clinical features before and after treatment and scoring was given to each symptom with scores ranging from 0 to 3.

The details of the drugs and their administration and duration are given in Table 1.

Follow-up

A minimum period of 2 months was kept for follow-up study.

Statistical test

The obtained data on the basis of observations were subjected to statistical analysis in terms of mean, standard deviation and standard error, and "t" test was used to calculate statistical significance. P < 0.001 was considered as highly significant, P < 0.05 or P < 0.01 as significant, and P < 0.10 or P > 0.01 as insignificant.

Observations and Results

The maximum number of the patients, i.e., 32.43% reported in the age group of 41–50 years. Majority of the patients (64.86%)

Table 1: Drug and duration

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	Jatipatradi Gutika	Yavanadi Churna		
Mode of administration	Local application	Oral		
Preparation of drug	Gutika	Churna		
Dose	3 g	6 g		
Time of administration	T.D.S.	T.D.S.		
Duration of treatment	30 days	30 days		
TDC share since deity				

TDS-three times daily

were females. Also, 51.36% of the patients were house wives, and majority of the patients (45.95%) belonged to middle class. 100% patients were having complaint of Chidrata, and Krishnata was present in 97.30% patients. Dantashoola was present in 94.59% patients and 89.19% patients were reported to have Dantaharsha. Daurgandhya was reported in 70.27% patients and Aniyamit Ruja was found in 54.05% patients. Three-fourths of the patients, i.e., 75.68% were using brush to maintain oral hygiene and the remaining patients were using finger for oral hygiene; more than three-fourths of the patients were using horizontal method while 18.92% patients were using vertical method for tooth brushing. Also, 65.57% patients were using tooth paste as the cleaning material and 24.32% were using tooth powder, and only 8.11% patients were using Datun. It was also observed that 70.27% of patients were vegetarians, 43.24% patients were of Vata Pitta Prakriti, 75.68% of patients were having Madhyama Samhanana and 51.35% patients were having Samagni, followed by 29.73% patients having mandagni, 10.81% having Tikshnagni and 8.11% were having Vishamagni. All the patients (100%) were having carious teeth.

In Group A, out of 13 patients, none was cured, 07.69% (one patient) showed marked improvement, 61.54% (eight patients) showed moderate improvement, and 30.77% (four patients) showed mild improvement in signs and symptoms [Figure 1]. The therapy was statistically highly significant in *Dantashoola*, *Dantaharsha*, *Aniyamit Ruja* and Daurgandhya. Clinically marked improvement in *Srava* and moderate improvement in *Shotha* and *Paka* were obtained [Table 2].

In Group B, out of 11 patients, none was cured and showed marked improvement [Figure 1]. Only 9.09% (1 patient) showed moderate improvement and 90.91% (10 patients) showed mild improvement. Statistically highly significant relief was obtained in the symptoms Dantashoola, Daurgandhya and Dantaharsha, and significant relief was obtained in Aniyamit *Ruja* [Table 3].

In Group C, out of 13 patients, none was cured and 7.69% (one patient) of the patients showed marked improvement. Also, 69.23% (nine patients) showed moderate improvement and 30.77% (three patients) showed mild improvement [Figure 1]. On statistical analysis, highly significant results were obtained in Dantashoola, Daurgandhya, Dantahrsha, and Aniyamit *Ruja*, whereas significant results were obtained in *Shotha*, and the result was insignificant in Chidrata, Krishnata, *Paka* and *Srava* [Table 4].

Discussion

Krimidanta (dental caries) is very common all over the world

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Chief complaints	Mean score		Relief	SD	SE	t	Р
	BT	AT	(%)				
Dantashoola	2.00	0.46	76.92	0.66	0.18	8.40	<0.001
Shotha	2.17	0.66	69.23	0.84	0.34	4.39	<0.01
Chidrata	2.15	2.15	00.00	0.00	0.00	0.00	>0.05
Daurgandhya	2.30	0.40	82.61	0.32	0.10	19.0	<.001
Krishnata	2.16	2.00	07.69	0.39	0.11	1.48	>0.05
Chaladanta	2.00	1.33	33.33	0.58	0.33	2.00	>0.05
Dantaharsha	2.41	0.33	86.21	0.29	0.08	25.0	<0.001
Srava	1.66	0.33	80.00	0.58	0.33	4.00	>0.05
Paka	2.00	0.66	66.67	0.57	0.33	4.00	>0.05
Aniyamit Ruja	2.12	0.37	82.35	0.46	0.16	10.69	<0.001

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Table 3: Effect on signs and symptoms (Group B)

Chief complaints	Mean score		Relief	SD	SE	t	Р
	BT	AT	(%)				
Dantashoola	2.50	0.80	68.00	0.48	0.15	11.129	<0.001
Shotha	3.00	1.50	50.00	0.71	0.50	1.00	>.05
Chidrata	2.36	2.36	00.00	0.00	0.00	0.00	>0.05
Daurgandhya	2.37	0.87	63.16	0.53	0.19	7.94	<0.001
Krishnata	2.18	2.00	08.33	0.40	0.12	1.49	>0.05
Chaladanta	2.50	2.00	20.00	0.71	0.50	1.00	>0.05
Dantaharsha	2.36	0.82	65.38	0.52	0.16	9.81	<0.001
Srava	2.00	1.50	25.00	0.71	0.50	1.00	>0.05
Paka	2.00	1.50	25.00	0.71	0.50	1.00	>0.05
Aniyamit Ruja	2.25	0.50	77.78	0.50	0.25	7.00	<0.01

Table 4: Effect on signs and symptoms (Group C)

Chief complaints	Mean score		Relief	SD	SE	t	Р
	BT	AT	(%)				
Dantashoola	2.58	0.58	77.42	0.43	0.12	<0.001	16.25
Shotha	2.25	0.50	77.78	0.50	0.25	<0.01	7.00
Chidrata	2.38	2.38	00.00	0.00	0.00	>0.05	0.00
Daurgandhya	2.37	0.25	89.47	0.35	0.12	<0.001	17.0
Krishnata	1.92	1.61	16.00	0.48	0.13	<.0.05	2.34
Chaladanta	1.50	1.00	33.33	0.71	0.50	>0.10	1.00
Dantaharsa	2.40	0.20	91.67	0.42	0.13	<0.001	16.5
Srava	2.50	050	80.00	1.40	1.00	>0.05	2.00
Paka	2.50	0.50	80.00	1.41	1.00	>0.05	2.00
Aniyamit Ruja	2.25	0.25	88.89	0.53	0.19	<0.001	10.58

and involves all the age groups due to bad oral hygiene, lack of awareness about proper oral hygienic measures and bad habits like chewing tobacco, smoking, etc.^[5] Krimidanta is silently progressive in nature. Generally, the disease Krimidanta is neglected by the patients till the pathogenesis become irreversible. It is observed that patients are worried of the time consuming and lengthy treatment like scaling, filling, root canal treatment and consulting the dentist regularly. Improper management in early stage leads the disease to the chronic phase. Dental caries is a problem related to the improper oral care; if at an early stage, the condition is neglected by the patients, the disease finally results in tooth loss. Dental caries affects mostly the population between the ages of 14 and 20 years, during which decay activity is the highest.^[10] Though many theories are put forth to understand the exact mechanisms of caries formation, still the exact mechanism is not known. Dental caries is a microbial disease of the calcified tissues of the teeth, characterized by decalcification of the inorganic portion and destruction of the organic substances of the tooth.

Toothpaste was used by a majority of the patients (67.57%). This indicates that common toothpaste has no role in curing the



Figure 1: Overall effect of therapies

disease. Exactly 51.35% of the patients were found to clean their teeth only once in a day, indicating lack of importance of oral hygiene after taking food or meals. It results in bacterial growth at the place of food collection, resulting in a dental plaque. Halitosis was observed in 70.27% of the patients, which indicates the disease *Krimidanta* itself. In modern dentistry, it has also been mentioned that the tooth is the primary host factor. It has been proved that the caries susceptibility of a tooth is inversely proportional to its fluorine, calcium and tin contents.^[9] A bolus of food on the occlusal or incisor surface of a tooth, the area on the tooth surface where the food can stagnate for more time, is called non–self-cleansable area. It is highly susceptible for dental caries.

Probable mode of action of drugs

Jatipatradi Gutika

On reviewing the properties of the drug Jatipatradi Gutika, it is seen to contain predominantly Katu (25%) and Tikta (40%) Rasa. Jatipatradi Gutika is Krimighna, Shodhana, Kledopuyahara, and with its Veerya being Ushna, it is Kapha Vata Shamaka. Its Vipaka being Katu normalizes vitiated Kapha, and Madhura Vipaka normalizes vitiated Vata and Pitta. Krimidanta is mainly caused by vitiated Vata along with Kapha and Krimi. The Tikta Rasa has Pitta Shamaka properties. Tikta Rasa helps in removing the debris, fetor and thus ultimately improves and maintains the oral hygiene. Due to Kashaya Rasa, it relieves pain, reduces bleeding and burning sensation. The properties like Laghu, Ruksha, Tikshna Gunas help in Kapha Shamaka. Hence, it is useful in reducing discharge and swelling.

Majority of the ingredients of the Jatipatradi Gutika have the properties of Krimighna, Vedanasthapaka, Shothahara, Shoolaprashamana, Uttama Ama pachaka, Rakta Shodhana and Vrana Ropana. In the disease Krimidanta, the above action of the drugs may act directly over such cardinal signs and symptoms of Krimidanta like Danta Shoola, Daurgandhaya, Aniyamit Ruja, Danta harsha, etc. Hence, the drug may be effective in treating Krimidanta.

Yavanadi Churna

In classics, it has been explained that all diseases probably

manifest due to vitiation of Agni.^[10] Hence, to prevent and manage the disease, its root cause should be treated, i.e., Agni. The ingredients of Yavanadi Churna, in addition to other properties, also have the Agni deepana and Amapachana properties; so, it may cure the root cause of dental caries. Hence, the oral medication was selected in this study.

On reviewing the literature related to the properties of the drug Yavanadi Churna, it is seen to be having predominantly Katu, Tikta Rasa, Laghu, Ruksha Gunas, Ushna Veerya and Katu Vipaka. The constituents of Yavanadi Churna comprise Katu Rasa (39%), Tikta Rasa (26%) and Madhura Rasa (26%). Katu Rasa acts as a Shodhana, Lekhana. Kledoshoshaka, Varnashamaka, Krimighna and Kaphanashaka.

Mostly, Laghu Guna (50%) and Ruksha (20%) Guna are found in Yavanadi Churna. Laghu-Ruksha Gunas are Kapha Shamaka. These Doshas play an important role in the causation of Krimidanta. This drug is mostly (80%) Ushna Veerya. Ushna Veerya exhibits Vata-Kapha Shamaka activity. Vipaka was detected as Katu (80%) which probably normalizes vitiated Kapha and Vata. Hence, the drug may be effective in treating the disease Krimidanta.

Conclusion

From the results and observations of this study, it can be concluded that Jaipatradi Gutika has provided better results in Dantashoola, Daurgandhya, Dantaharsha, Aniyamit Ruja, Shotha and Paka in Krimidanta Roga. Yavanadi Churna has provided good results in Dantashoola, Aniyamit Ruja, Dantaharsha and Daurgandhya. No result has been obtained in Chidrata (cavity formation), Krishnata (discoloration), Shotha (swelling), Paka (discharge) and Chaladanta (mobility) in this group. In a nutshell, the present clinical study has established that combined therapy gives better results than individual therapies.

Acknowledgments

The author would like to express my sincere thanks to Dr. Manjusha Rajagopala, M.D. (Ayu), Ph.D., who guided me on this work, for her constant support and innovative suggestions, without which this would not have been possible. The author also grateful to authorities and members of research committee of I.P.G.T and R.A for providing me the available facilities for conducting this work. Lastly, The author acknowledge all the patients for their willingness and full cooperation given during the study.

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हिंदी सारांश

जातिपत्रादि गुटिका और यवान्यादि चूर्ण द्वारा कृमिदंत – डेन्टल केरीज पर चिकित्सकीय अध्ययन मक्बूल मन्सूरी, मंजूषा राजगोपाल, नारायण बावलत्ति

डेन्टल केरीज दन्त सतह पर सूक्ष्म जीवियों द्वारा प्रभावित इनेमल, डेन्टीन एवं सीमेंटम का क्रमिक क्षय है। यह दंत चिकित्सा के क्षेत्र में विकराल समस्या है।चिकित्सकीय लक्षणों के आधार पर इसकी तुलना कृमिदंत से कर सकते हैं, जो दांत की आठ व्याधियों में से एक है। कृमिदंत की चिकित्सा में कृमिध्न, व्रणध्न और उष्ण वीर्य द्रव्यों का प्रयोग करते हैं, जिससे दंतशूल और दंतवैवर्ण्य में लाभ मिलता है।इस अध्ययन में प्रतिसारण के लिए जातिपत्रादि गुटिका और मुख द्वारा सेवन के लिए यवान्यादि चूर्ण का प्रयोग किया गया। इस अध्ययन में शालाक्य तंत्र विभाग के बहिरूग्ण विभाग में आने वाले रूग्णों में से कृमिदंत – डेन्टल केरीज से पीडित रूग्ण पंजीकृत किए गए ।समूह ''अ'' के रूग्णों की चिकित्सा जातिपत्रादि गुटिका – प्रतिसारणार्थ ३० दिनों तक की गई । समूह ''ब'' के रूग्णों की चिकित्सा यवान्यादि चूर्ण द्वारा की गई एवं समूह ''स'' के रूग्णों को दोनों तरह की चिकित्सा ३० दिनों तक दी गई। चिकित्सकीय अध्ययन में युग्म चिकित्सा द्वारा एकल चिकित्सा से अच्छे परिणाम प्राप्त हुए।