



## A Single Case Study to Evaluate Effect of Tejovathyadi Kalka in Krimi Danta Janya Shoola

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(Received: 27 September 2025 Revised: 05 October 2025 Accepted: 25 November 2025)

### KEYWORDS

Tejovati,  
Dantadhavana  
choorna,  
Krimidanta,  
Krimidantaja -  
Shoola

### ABSTRACT:

**Background and Objectives:** The Global Burden of Diseases Study 2017 estimated that oral diseases affect approximately 3.5 billion people worldwide. Dental caries is the most prevalent chronic disease worldwide. Dental caries prevalence rate is increasing steadily. Improper tooth brushing, excessive intake of sugar or carbonated drink etc is leading cause for dental caries. Decayed tooth structure and bacterial infection leads to acidic pH of oral cavity further, irritate or damage the enamel and nerves within the tooth, leading to pain and discomfort. Even though there are many antibiotic tooth pastes, we can observe severe side effects on long term usage. Hence Dantadhavana with Tejovathyadi Kalka may not only prevent adverse effects of the chemicals but may also help in managing the dental caries.

**Materials and Methods:** Brushing teeth twice a day for 45 days with Tejovathyadi Kalka= Tejovathyadi choorna+ Madhu + Moorchita Tila Taila. **Results:** Improvement was observed in OHAT score, Plaque index, Gingival index, Sensitivity and Verbal rating Scale of Pain.

**Interpretation and Conclusion:** Dantadhavana with Tejovathyadi kalka may be more beneficial in maintaining Mukha Swasthya and managing Krimidantaja Shoola. It is chemical free and may not have any adverse effect on long term use.

### INTRODUCTION:

Dental caries is the most prevalent chronic disease worldwide. The Global Burden of Diseases Study 2017 estimated that oral diseases affect close to 3.5 billion people worldwide. Globally, it is estimated that 2.3 billion people suffer from caries of permanent teeth and more than 530 million children suffer from caries of primary teeth<sup>1</sup>. Dental caries has a high prevalence rate of about 49%–83% in various countries as per the various surveys done globally<sup>2</sup>.

Dental caries is also known as cavities and is caused by the bacteria and enamel damaging substances like acid or food remnant, etc that comes in contact with the teeth leading to acidic pH of saliva and further damages the tooth enamel<sup>3</sup>. Dental caries forms through a complex interaction over time between acid-

producing bacteria and fermentable carbohydrate, and many host factors including teeth and saliva<sup>4</sup>. Symptoms of dental caries include tooth sensitivity, pain when chewing, visible pits or holes, and white, brown, or black stains on the teeth<sup>3</sup>.

Dental caries can be correlated to Krimidanta. Caused due to Nidan Saven (Aati sevana of madhura, amla, lavana rasa) leading to Kapha-Vata dominance in Danta Moola further causing Anna Mala Poorana (Food lodgement) leading to Danta Majja Shoshana and Krimi Utpanna which further leads to Krimi Danta<sup>5</sup>, which may be associated with symptoms like Dantashoola, Maharuja, Ahetu-teevaruaj, Puti-gandhta, Krishnachidra, Sraavi, Shotha, Lalima, Chalata in the affected Danta. As per Ayurveda, Krimidanta is Vatapradhana Tridosha Vikara<sup>6</sup>.



Toothache combined with dental caries is known as Carious Odontalgia. This occurs when nerves within the tooth will be damaged because of decayed tooth structure and bacterial infection, leading to pain and discomfort with various triggering factors. This condition can progress further forming pus and lead to abscess, increased mobility in tooth or other systemic complications if not treated early <sup>7</sup>. Now a days there are various medications available to manage pain due to dental caries, such as non-steroidal anti-inflammatory drugs, other opioid drugs, application of analgesics, etc. But if these medications are over used or used for long term it may damage tissue <sup>8,9</sup>.

In Ayurveda, for Krimidanta-janya shoola, Vatahara, Krimighna, Ushnavirya, etc. guna dravyas will be beneficial <sup>10</sup>. Various medications are explained to strengthen Teeth and Gums and Vidhi like Dantagharshana, Gandusha and Kavala. Acharyas have also mentioned Dantashodhana choorna for Sadaturas <sup>11,12,13</sup>.

Acharya Sushruta mentioned Tejovathyadi Kalka for Dhantashodhana which consists of Tejovati, Tri-katu, Tri-sugandhi, Saindhava Lavana, Moorchita Tila Taila and Madhu <sup>11</sup>, which has the quality of Nihanti Gandha Vairasya, Niskrushya Malam Jihwa Danta Asyajam, Ruchim Aadatte and Vaishadya <sup>14</sup>, decreasing tooth sensitivity and prevention of Mukha roga

Dental caries is steadily increasing and treatment available is expensive and is with few side effects. Hence Tejovatyadi kalka is acceptable, easily available, cost effective and chemical free. A case study of Dental Caries was taken to evaluate effect of tejovathyadi kalka in Krimi Danta for management of Shoola.

#### CASE REPORT:

A 47 years old female patient reported to Swasthavritta OPD Shri Jagadguru Gavisiddeshwara Ayurvedic Medical Hospital, Koppal, Karnataka on 24/08/2022 with the chief complaint of Toothache, Sensitivity to cold and sweet food articles since 15 days.

#### History of Present illness:

Patient was said to be apparently well before 2 months, later complaints of gradual increase in tooth sensitivity

to cold food articles and since 15 days complaints of toothache in lower jaw left molar teeth, which increased due to chewing hard food, sweets and cold food article.

#### Personal and Socio – Economic History

Patient is a house wife and belongs to Higher Middle class.

Patient brushes teeth once a day, does not follow proper technique of tooth brushing, does not practice Kavala/Gandusha. Patient is habituated to excessive sweets and chocolates.

**Surgical History:** None

#### Examination:

All Vitals are stable.

On examination overall oral hygiene = Good

Small hole with Black discoloration in 2<sup>nd</sup> Molar teeth of Left Lower Jaw

Tenderness + in Left Lower Jaw 2<sup>nd</sup> Molar Teeth

**Daagnosis:** Krimi Dantajanya Shoola

#### MATERIAL AND METHODOLOGY:

**Center of Study:** Shri Jagadguru Gavisiddeshwara Ayurvedic Medical College, Koppal

**Method of Sampling and Study Design:** Single Case Study

**Materials:** Tejovatyadi Kalka

**Table 1: Ingredients of Tejovathyadi Kalka <sup>11</sup>**

Sl no	Drug Name	Botanical name
1	Tejovati	Zanthoxylum armatum
2	Shunti	Zingiber officinale
3	Maricha	Pipper nigrum
4	Pippali	Pipper longum
5	Tvak	Cinnomomum zeylanicum
6	Patra	Cinnomomum tamala



7	Ela	Elettaria cardamomum
8	Hareetaki	Terminalia chebula
9	Vibhitaki	Terminalia belerica
10	Amalaki	Emblica officinalis
11	Saindhava	Rock salt
12	Madhu	Honey

13	Moorchita Tila Taila	Oil
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**Method of Brushing:**

Brushing with Soft Tooth brush (Mrudu Kurchakena) Vertically, Circular technique and Roll methods, twice per day (Morning before breakfast and Night after dinner)

**ASSESSMENT CRITERIA AND OBSERVATION****a. Oral Health Assessment Test <sup>28</sup>****Table 2: OHAT assessment before and after intervention**

Category	0= Healthy	1=Changes	2=Unhealthy	Score (BT)	Score (AT)
<b>Lips</b>	Smooth, Pink, Moist	Dry, Chapped, or Red at corner	Swelling/Lump, White/Red ulcerated patch, Bleeding/ Ulcerated at corner	1	1
<b>Tongue</b>	Normal, Moist, Pink	Patchy, Coated, Fissured, Red	Red/White Patch, Ulcerated, Swollen	0	0
<b>Gums and Tissue</b>	Pink, Moist, Smooth, No-bleeding	Dry, Shiny, Rough, Red, Swollen around,	Swollen, Bleeding around 7 teeth or more, loose teeth, ulcers, White Patches, Redness, Tender.	1	0
<b>Saliva</b>	Moist tissue Watery and Free flowing saliva	Dry, sticky tissue, little saliva present, patient think they have dry mouth	Tissue parched and red, Very little/ no saliva, Thick saliva, Ropey, Patient complaint of Dry Mouth	0	0
<b>Teeth</b>	No Decayed or Broken teeth/ roots	1 to 3 decayed or broken teeth/ roots	4 or more Decayed or Broken teeth/ roots  Very worn down teeth or less than 4 teeth with no dentures.	1	1
<b>Oral Cleanlines</b>	Clean and no food particle or tartar on teeth or	Food particles/ tartar/ debris in 1 or 2 areas of the mouth or on small area of dentures;	Food particles, tartar, debris in most areas of dentures or severe halitosis (bad breath)	1	0



	dentures	occasional bad breath			
<b>Dental Pain</b>	No behavioral, verbal or physical signs of Pain	Verbal or behavioral signs of pain such as pulling of face, chewing lips, not eating, aggression	Physical signs such as swelling of cheek or gum, broken teeth, ulcers, gum boil, as well as verbal or behavioral signs of pain	1	0
<b>Oral Hygiene</b>	<b>Total Score</b>			5	2

**b. Gingival Index (for Inflammation)**

**Grade 1:** Normal gingiva; no-inflammation; No discoloration No bleeding

**Grade 2:** Mild inflammation; slight erythema; minimal superficial alteration. No bleeding

**Grade 3:** Moderate inflammation; erythema; Bleeding on Probing

**Grade 4:** Severe inflammation/ erythema / swelling; tendency to Spontaneous Bleeding; Possible ulceration

**c. Plaque Index:**

**Grade 1:** No Plaque

**Grade 2:** Thin Plaque layer at the gingival margin, only detectable by scraping with a probe.

**Grade 3:** Moderate layer of plaque along the gingival margin; interdental space free, Plaque is visible to the naked eye

**Grade 4:** Abundant plaque along the gingival margin; interdental spaces filled with plaque

**d. Verbal Rating Scale (for Pain)**

**Grade 1:** No pain

**Grade 2:** Mild Occasional Pain (when exposed to triggering factor)

**Grade 3:** Moderate Pain

**Grade 4:** Severe Pain

**Grade 5:** Worst Pain

**e. Caries**

**Grade 1:** Sound tooth surface

**Grade 2:** Mild visual change in enamel

**Grade 3:** Distinct visual change in enamel

**Grade 4:** Localized enamel breakdown without visible dentin

**Grade 5:** Dark shadow from dentine without enamel breakdown

**Grade 6:** Distinct cavity with visible dentin

**f. Mobility**

**Grade 1:** Absence of mobility

**Grade 2:** Noticeable movement in its socket within 1mm range



**Grade 3:** Noticeable movement in its socket within 2mm range

**Grade 4:** Noticeable movement in its socket more than 3mm range

#### g. Tooth Sensitivity

**Grade 1:** Absence of sensitivity

**Grade 2:** Mild hypersensitivity

**Grade 3:** Moderate hypersensitivity

**Grade 4:** Severe hypersensitivity

#### h. Discoloration

**Grade 1:** Absence of discoloration

**Grade 2:** Mild discoloration

**Grade 3:** Half discoloration

**Grade 4:** Full discoloration

#### RESULTS:

**Table 3: Results of Intervention based on different assessment criteria**

Assessment	Before Treatment	After Treatment
<b>OHAT score</b>	5	2
<b>Gingival Index</b>	Grade - 2	Grade - 1
<b>Plaque Index</b>	Grade - 2	Grade - 1
<b>Verbal Rating Scale of Pain</b>	Grade - 3	Grade - 2
<b>Caries</b>	Grade - 2	Grade - 2
<b>Mobility</b>	Grade - 1	Grade - 1
<b>Sensitivity</b>	Grade - 3	Grade - 2
<b>Discoloration</b>	Grade - 1	Grade - 1

#### DISCUSSION:

Oral hygiene practices methods are being practiced since many centuries like toothpicks, toothpowder/ toothpaste, tongue cleansing, gargling,

mouthwash, flossing, etc. Even in Ayurveda they have given importance for maintenance of oral hygiene, mentioned Dantadhavana, Pratisarana, Jihwa Nirlekhana and Kavala-Gandusha.

Tooth brushing plays an important role in maintenance of oral hygiene. In market there are many toothpaste available, but every toothpaste consists of one or the other chemical ingredient like abrasives, detergents, anti-microbial agents and flavoring agents which has the adverse effect over the health on long term use such as High relative Dentin abrasive leads to Inflammation, Fluoride leads to Fluorosis, Sodium Lauryl Sulfate leads to irritation to skin, eye and respiratory tract, Anti-bacterial agent: Triclosan leads to Neuro-toxic effects, etc

Dantadhavana with the herbal drugs that is Tejovathyadi Kalka this paste must be daily prepared and used freshly, as described by Acharya Sushruta under Dinacharya practice which may help in Managing tooth ache, maintenance of oral hygiene and prevention of oral disorders.

**Discussion on Results:** Effects were seen in:

**OHAT score:** improvement was seen in Gums and Tissues, Oral Cleanliness and Dental pain, may be due to Anti-inflammatory, Anti-biotic and analgesics effects of Tejovathyadi Kalka.

**Gingival Index:** at first there was Mild inflammation, after intervention the inflammation was reduced, because of the anti-inflammatory effect of drug.

**Plaque Index:** at the time of inspection there was thin layer of plaque which was detectable on scraping, after intervention there was no plaque detected by scraping. Improvement was seen may be because kalka acts as Abrasive, it even helps in maintaining Basic pH of saliva and reduces plaque formation

**Verbal Rating Scale of Pain:** at first patient complained of Moderate pain, after intervention there was mild reduction in pain, which may be due to Analgesic property of Tejovatyadi kalka. But there was pain on exposure to triggering factor which may be due to the excessive lodgment of Krimi in Danta Majja.

**Tooth Sensitivity:** at first Moderate tooth sensitivity was seen, after intervention there is mild reduction in it,



which may be due to tooth enamel strengthening and Remineralization properties of Tejovatyadi kalka

### **Probable Mode of action of Drugs used:**

Mainly consists of Tejovati, Triphala, Trikatu, Trijataka, Saindhava Lavana, Madhu and Moorchita Tila Taila.

#### TEJOVATI<sup>15</sup>:

Kapha-Vata Hara which acts as Danta-Mala Hara, acts as Kantya.

Indicated for Mukharoga, Dantaroga, Kantaroga, etc

Also known as Toothache tree.

Berberine can promote periodontal tissue recovery and suppress inflammatory cytokine levels in experimental periodontitis.

Magnoflorine is potent anti-inflammatory.

#### SHUNTI<sup>16</sup>:

Kapha-Vata Hara, increases the salivation which reduces Jihwa Liptata, Bhedana helps in reducing Danta-Jihwa Mala. Indicated for Shula

Methanolic fraction of Zingiber officinale reduces the pathogenesis of Streptococcal Mutans.

Gingerol acts as Anti-inflammatory.

Anti-bacterial Property helps in prevention of growth of bacteria and Plaque.

#### PIPPALI<sup>17</sup>:

Vata-Kapha Hara, increases salivation which reduces Jihwa Liptata and helps in maintaining basic pH of Saliva and acts as Shula Hara hence beneficial for pain.

Essential oil helps in prevention of gum disorder and reduces the germs that causes tooth ache, mono and sesquiterpenes acts as anti-inflammatory and anti-carcinogenic and anti-microbial, Caryophyllene improves periodontal health, Piperine enhances periodontal repair, etc

#### MARICHA<sup>18</sup>:

Kapha-Vata Hara, increases salivation reduces Jihwa Liptata and maintains pH of Saliva

Indicated in Krimiroga because of the Teekshna Guna and Shula hence can reduce dental cavity.

Piperene enhances collagen repair, Pinene acts as anti-microbial, anti-biotic and analgesic.

#### TVAK<sup>19</sup>:

As it is Sugandi Dravya it mainly reduces the Mukha Daurgandhya.

It is Aruci Hara because of its Teekshna Guna it stimulates taste buds, Krimiroga Hara hence can prevent dental caries.

Cinnamaldehyde acts as antioxidant, Antifungal, anti-mutational, etc hence prevents from dental caries.

Eugenol acts as anti-inflammatory and local anesthetic, Pinene acts as anti-biotic, anti-inflammatory and analgesics helpful for Maintenance of oral hygiene and prevents dental caries.

#### PATRA<sup>20</sup>:

Kapha-Vata Hara, acts as Ruchya which helps in stimulating taste buds hence indicated in Aruci, Hrullasa, etc, as it is Sugandi Dravya it even reduces Mukha Daurgandhya

Eugenol acts as anti-inflammatory and local anesthetic it cures the dental and gum disorders,

Cinnamic aldehyde or Cinnamaldehyde acts as Anti-oxidant, anti-bacterial, anti-fungal hence it is helpful in maintaining oral hygiene,

Linalool it is helpful in all pathogens related oral disorders.

#### ELA<sup>21</sup>:

Acts as Rochana or Ruchya as it stimulates the taste buds it helps in Aruchi.

Bornneol acts as anti-inflammatory and has healing effect on oral mucosa, p-cymene acts as Anti-oxidant property, D - limonene helps in reducing dryness in mouth, Linalool reduces the pathogens in oral disorder, Menthone is the flavoring agent helps in reducing Mukha Daurgandhya, etc



## HARITAKI<sup>22</sup>:

Has Lekhana property which acts as Danta Mala Hara and helps in maintaining the oral hygiene, etc.

Shotha Hara helps in reducing inflammatory condition, Vrana Hara repairs the damage in oral cavity, Krimiroga Hara prevents from dental caries.

Antraquinone glycoside acts as anti-inflammatory mainly reduces mouth ulcer and denture irritation, Chebulinic acid acts as antioxidant and anti-bacterial helps in preventing dental caries and maintains the oral health, Tannic acid has Anti-adherent and anti-biotic properties improves the oral hygiene, Vitamin C prevents gums and periodontal diseases.

## VIBHITAKI<sup>23</sup>:

Bhedana reduces the Danta Mala, Madakari helps in reducing the pain.

Indicated in Shula conditions and it even acts as Rakta Sthambaka helpful in repairing the oral tissue damage, etc

Galactose prevent caries by inhibiting the biofilm formation of Streptococcus mutans hence maintains the oral hygiene.

## AMALAKI<sup>24</sup>:

Acts as Rasayana which helps in nourishing the oral cavity and helps in repairing the oral mucosa and even helps in maintaining oral health, Shula Hara helpful in dental caries, etc

Vitamin C prevents gums and periodontal diseases, Phyllembin acts as antioxidant which helps in maintaining the oral health.

## SAINDHAVA LAVANA<sup>25</sup>:

Helps in maintaining basic pH of saliva by increasing the salivation which in-turn reduces Jihwa Liptata.

Acts as Vrana Hara, as it helps in repairing the damaged tissues, act as Shula Hara by preventing dental caries.

Sodium Chloride acts anti-inflammatory and anti-bacterial, Iodine prevents dental cavity, Magnesium strengthens the teeth enamel, Potassium helps in strengthening teeth and even prevents periodontal disorders, Iron helps in maintaining the oral health by proper blood circulation to oral cavity, Zinc helps for healthy teeth formation and prevents the formation of plaque and calculus. Salt even acts as mild abrasive which prevents from plaque formation and in turn dental caries.

## MOORCHITA TILA TAILA<sup>26</sup>:

Acts as Balakara which helps in strengthening the teeth especially it's enamel, it is also considered as Dantya because oil acts as anti-microbial and reduces the formation of plaque prevents from dental cavity

Manganese suppresses the development of oral leukoplakia by activating the immune response, Calcium inhibit demineralization and enhance remineralization, hence salivary calcium form a natural defense mechanism against dental caries, Magnesium strengthens the teeth enamel, Potassium helps in strengthening teeth and even prevents periodontal disorders, etc

## MADHU<sup>27</sup>:

Kapha-Pitta Hara which helps in Danta Mala Hara, Vranashodana hence repairs the damaged oral tissue, Saukumaryakara helps in softening the oral tissue, Srotoshodana acts as Danta Mala Hara etc

Acts as Krimi Hara which helps in preventing the Dental caries, Madhu is used as the binding agent of Choorna to prepare it into Kalka

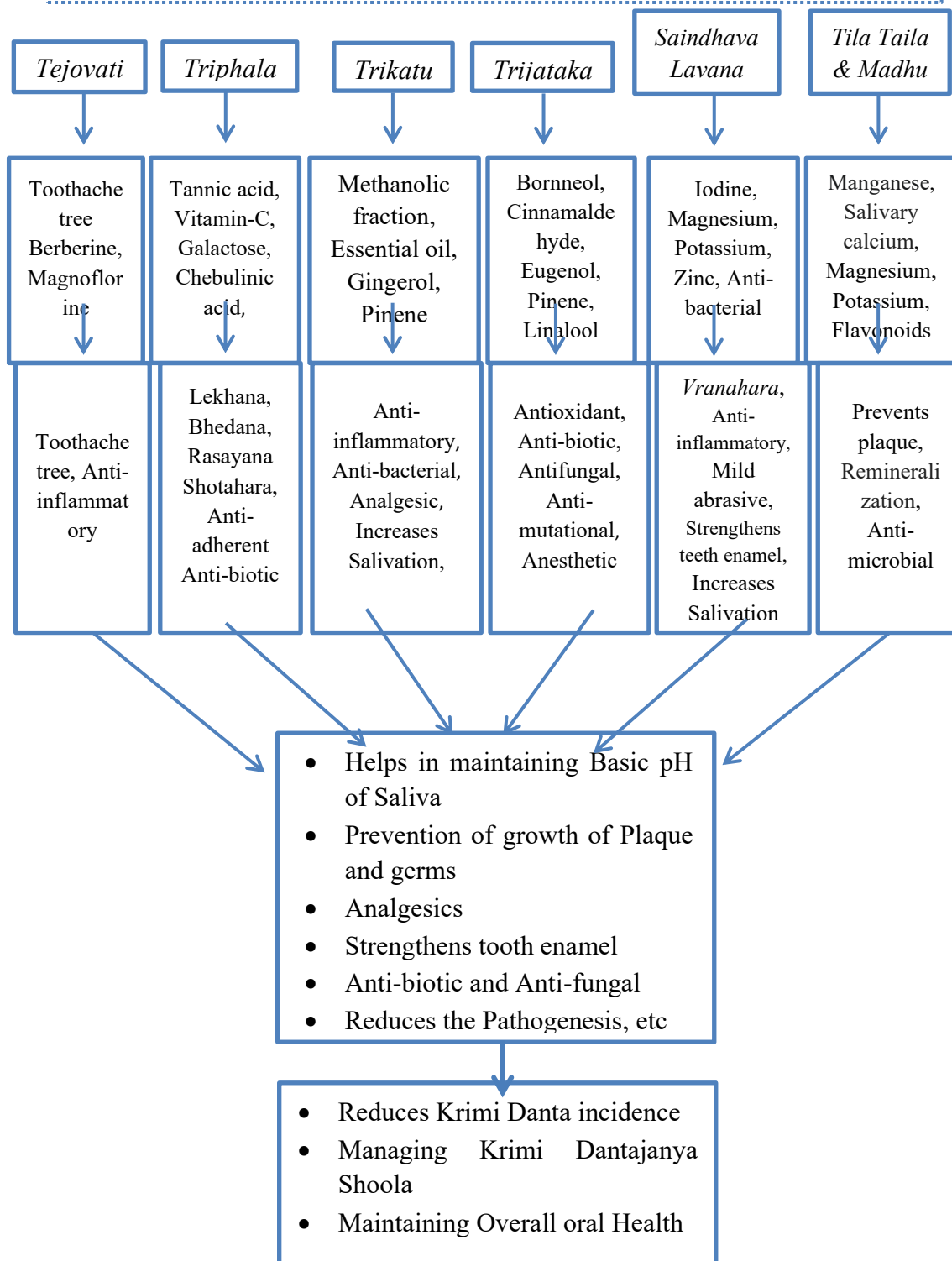
Amino-acid helps in healing oral mucosa, Vitamin C prevents gums and periodontal diseases, Phyllembin acts as antioxidant which helps in maintaining the oral health, Flavonoids acts as anti-microbial.



PROBABLE MODE OF ACTION OF TEJOVATYADI KALKA

1. Shoola Hara:

**Flowchart no 01: Effect of Tejovatyadi Kalka on Krimi Dantajanya - Shoola**





## CONCLUSION:

Mukha being the entry to Koshta and it is best site for growth of micro-organism hence maintaining Mukha Swasthya acts as primary prevention of infectious disorders.

By this study it can be concluded that brushing teeth with Tejovatyadi kalka may be more effective to manage Krimidanta-janya Shoola and Tooth Sensitivity rather than using other market available toothpastes. As it acts as effective antibiotic, antimicrobial, analgesic, strengthens oral cavity, maintains basic ph in oral cavity, Chemical free, etc. But would be better if Dental carries was addressed at first.

Improvement was observed in OHAT score, Plaque index, Gingival index, Tooth Sensitivity and Verbal rating Scale of Pain. No side effects were seen throughout study.

## SCOPE FOR FURTHER STUDY:

Study can be carried out with larger sample size.

Study can be done for larger duration.

Study can be done to evaluate preventive effect on secondary caries.

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