IJBPAS, March, Special Issue, 2022, 11(3): 217-229

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

CLINICAL EFFICACY OF PATOLADI KASHAYA GANDOOSHA IN THE MANAGEMENT OF SHEETADA (GINGIVITIS)

PANDEY PK[1], KESKAR M[2], NAYAK Y[3] AND VIJAYAN A[4]

1, 3, 4: Final Year P.G, Dept. of Shalakya tantra Parul institute of Aurveda, Parul University, Vadodara Gujarat India

2: Professor, Dept. of Shalakya Tantra, Parul institute of Aurveda, Parul University, Vadodara Gujarat India

***Corresponding Author: Dr. Manjiri Keskar: E Mail: manjirikeskar@gmail.com**

Received 12th Dec. 2021; Revised 14th Jan. 2022; Accepted 7th Feb. 2022; Available online 5th March. 2022

https://doi.org/10.31032/IJBPAS/2022/11.3.1027

ABSTRACT

Sheetada is one of the common disorders of *Dantmoola* which is characterised by the *Raktasrava* (Bleeding gum), *Durghandha* (halitosis), *Krushnta* (Discolouration of gums), *Kledata* (Excessive dischargre) *Mruduta* (Softnes of gums), *Shinnata* (gum recession). It can be correlated by Gingivitis. Gingivitis is a non-destructive periodontal disease, when it untreated, it may progress to periodontitis, which is a destructive form of gum disorder[2]. Hence Prevention and control of Gingivitis at the earliest is essential. A 42 yrs old female Patient visit our OPD, she was suffering from *Raktasrava* (Bleeding.gum), *Durghandha* (halitosis), *Krushnta* (discoloration of gums), *Kledata* (Excessive dischargre), *Mruduta* (Softness of gums), *Shinnata* (Gum recession). For last 6 months, She had a history of tobacco chewing for last 2 years. The Patient was treated with *Raktamokshan* (Bloodletting) with the *Pracchan* (Scraping) on first day followed by *Patoladi Khashya Gandoosha* (Gargling) (twice a day; in morning and evening) *Patoladi chuna pratisarana* (Application) (twice daily) for 7 days. *Avipattikar churna* 5 gm at night for Purgative action and the follow-up is taken on 8th day, patient got complete relief from the symptoms. As we going through the mode of action of *Gandoosha* (Gargling) work of the principle of osmosis and this activity helps to rinse the pathogen and expel the toxins out. It is a Procedure which

stimulates the nerves and taste buds in oral cavity and hence enhances the absorption of medicine.

Keywords: Gandoosh, Gingivitis, *Pratisaran, Rakta mokshan, Sheetada*

INTRODUCTION

In *Ayurveda* medical science *Susrutha Samhitha* is an authentic text. *Acharya susrutha* described *Sheetada* is one of the *Danthamoolagatha roga* (periodontal disease) out of 15 diseases of *Danthamool*.[(1)] is the early stage of periodontal disease that may progress later on to *Danta vesta* and *Upakusha* state if untreated. Fast food culture, unhealthy habits like smoking, betel chewing and improper oral hygienic measures leads to vitiation of *Kapha* and *Raktha dosha*[(2)] which contributed to *Sheetada* that manifested with *Akasmath Raktasrava* (Bleeding gum), *Krishnata* (discoloration of gums), *Prakledata* (moistness), *Mrudutha* (sponginess), *Shotha* (gingival swelling), Mukha Daurgandhya (halitosis) as initial clinical features. Paka (Suppuration), Danta Mansha Shiryamanata (gum recession) and Chalata (tooth mobility) may be seen in later stage. When compared with marginal gingivitis accumulation of debris, plaque, calculus at the tooth margin can be seen due to ignorance of oral care thus it progresses into periodontitis manifesting with the symptoms of firmness, altered contour of gums, mobile teeth, spacing and drifting. As per the modern dentistry causative local factors of marginal gingivitis are microorganisms, calculus, food impaction, faulty restorations, mouth breathing, tooth mal position and the systemic factors as nutritional deficiency (vitamins, minerals, protein), certain drug allergies (phenol, silver nitrate, aspirin) etc. endocrine dysfunctions, puberty, pregnancy, menstrual cycle. Irrigation Scaling and polishing, root planning, gingivoplasty are the treatment options in management of marginal gingivitis. Hence prevention and control of gingivitis at the earliest is essential to achieve better prognosis. In *Ayurveda* classics, Astang Hridaya Uttartantra 2nd chap. *Acharya Vagbatta* has mentioned several treatment modalities for the management of *Sheetada. Pratisarana* (rubbing), *Visravana* (bloodletting), *Pralepa* (paste), and *Kavala* (gargling) have been prescribed by ancient *Ayurveda* scholars. It is recommended that *Gandush* (Gargling) (holding liquid in the mouth full of capacity without movement) in the management of *Sheetada.* [(3)]

Among these, 1st day patient had underwent for *Prachhana karma* (Scrapping) in gums. *Prachhana* (Scrapping) is a procedure which helps to drain out the impure blood from gums.

Patoladi Kashaya Gandooshhas been selected to this study as *Gandooshand* local application is done with *patoladi churna* which

therapeutically provides *Shodhana* (cleansing), *Ropana* (growing) actions. *Patoladi Kashaya Patola, Shunti, Triphala, Vishala, Tikta ,Haridra*, *Daruharidra, Amrita*) *Gandoosha Ayurveda* formulation is *Kapha-Pitta Shamaka (*pacifing *Pitta* and *Rakta*) and has *Shothahara* (anti-inflammatory), *Krimighna* (anti-microbial) and *Rasayana* (rijuvenation) properties are likely to be effective for the management of *Sheetada.* In gandoosh , yavkoot of herbal formula boiled and Luke warm decoction added with 5 ml of honey and was taken in a glass; Patient was advised to fill it in mouth and hold it for 3 to 5 min. In *Pratisaarana* procedure the patient was advised to use the medicated powder for rubbing over the gums. As brushing of teeth is contra indicated in *mukha paaka* by *Acharya Nimi*; Selected the *Pratisaarana* as an alternative. Above two process removes the food debris and plaque moreover increase blood circulation, enhance gingival defence mechanism, giving strength to gingival fibers which are the main healing factors of the disease and it works as the reflection of the body health by acting as the gateway of alimentary canal. The three procedures are aimed at breaking the pathogenesis of the disease and improving the health of the gingiva and maintain a healthy periodontium. It pacifies the *Rakta dosha* which the prime vitiating factor in *Sheetada* resulting by *Dosha Shamana*. And Patient is adviced to take *Avipattikara churna* 2gm at bed time;because of it's *Anulomana* property.[4] In present era, sudden increase in the use of herbal extracts or plant products as an alternative approach to modern day medicines therefore, this research was designed to introduce scientifically proven *Gandoosha* formula for the management of *Sheetada.*

Etiophathogenesis of Gingivitis-

Introduction

Gingivitis is an inflammatory condition of the gingival tissue, most commonly caused by bacterial infection. Unlike Periodontitis, there is no attachment loss and therefore no migration of the junctional epithelium. The condition is restricted to the soft-tissue area of the gingival epithelium and connective tissue.[5] Among all the periodontal diseases, gingivitis is considered to be the commonest. There are various forms of gingivitis based on clinical appearance, duration of infection, severity, and etiology. However, the chronic form of gingivitis that is caused by plaque is considered to be the most frequent variant. Clinically, the gingival tissues are characterized by swelling, redness, tenderness, a shiny surface, and bleeding upon gentle probing. Gingivitis seldom generates spontaneous bleeding and is commonly painless, therefore many patients do not recognize the disease and fail to seek attention[6].

Etiology

Gingivitis is caused by the microbial plaque deposits located in or close to the gingival sulcus. The microorganisms more strongly associated with the etiology of gingivitis include species of Streptococcus, Fusobacterium, Actinomyces, Veillonella, and Treponema. Bacteroides, Capnocytophaga, and Eikenella are also potentially linked to the etiology of the disease. There may be other local or systemic etiologic factors that intensify plaque deposition or the vulnerability of the tissue to the microbial attack[7].

Based on the etiology, gingivitis can be classified into different types.

Plaque Induced Gingivitis

This is the most common cause of gingivitis. Plaque is a thin film that forms on the tooth surface due to poor oral hygiene. If not regularly removed, it can harden up and form calculus. As plaque harbors a large number of bacteria, inflammation can occur in the gingival tissue.

Some local factors can contribute to the formation of plaque, such as crowding of teeth due to which plaque removal becomes difficult. As misaligned teeth often require orthodontic correction, cleaning difficulty increases accumulating more plaque. Furthermore, a dental prosthesis that does not have an adequate fit or is not properly finished can also act as a nidus for plaque accumulation.

In children, tooth eruption is frequently associated with gingivitis as plaque accumulation tends to increase in the area where primary teeth are exfoliating, and permanent teeth are erupting as oral hygiene may be difficult to be maintained in these areas. This is referred to as eruption gingivitis.

Nutritional Gingivitis

This may occur due to a deficiency of vitamin C. It has been found that a modern lifestyle with the intake of an increased amount of refined carbohydrates and an increased ratio of omega-6 to omega-3 fatty acids can promote the inflammatory process[8].. The mechanism by which carbohydrates with a high glycemic index promote the inflammatory process is through activation of NFkB and oxidative stress[9,10].

Hormonal Gingivitis

During pregnancy, there are not only changes in hormone levels but also a greater predisposition to dilating blood vessels. These factors contribute to an exaggerated inflammatory response by the gingival tissues even to a minor quantity of plaque accumulation. In fact, it has been suggested that the levels of estrogen determine the severity of gingival inflammation created against the biofilm at the gingival margin. [11,12].

The hormonal alterations that occurred during puberty influence how the gingival tissue reacts to plaque accumulation causing what is

known as puberty gingivitis. It has been found that in the cytoplasm of the cells of the gingiva, receptors for both estrogens and testosterone that have a high affinity for these hormones are present. The receptors for estrogen are specifically present in the basal and spinous layers of the epithelium. In the connective tissue, such receptors are found in the fibroblasts and endothelial cells of small vessels. Therefore, the gingiva is an easy target organ for these steroid hormones resulting in gingivitis. It has been observed that during adolescence, gingivitis appears earlier in girls (eleven to thirteen years) than in boys (thirteen to fourteen years) [(13)]..

Drug-Induced Gingivitis

Various drugs used for systemic conditions can cause gingivitis as a side effect such as phenytoin (used for epileptic seizures), calcium channel blockers (used for angina, high blood pressure), anticoagulants, and fibrinolytic agents, oral contraceptive agents, protease inhibitors, vitamin A and analogs. The mechanism behind this gingival inflammation is thought to be the ability of the metabolites of these drugs to induce the proliferation of fibroblasts. An imbalance between the synthesis and the degradation of the extracellular matrix leads to the accumulation of immature proteins in the extracellular matrix, particularly collagen. This, in turn, results in gingivitis[(14)]..

Apart from the already mentioned, various risk and influencing factors can contribute to the development of gingivitis. These include smoking and tobacco chewing, systemic conditions, genetic factors (hereditary gingival fibromatosis), and local conditions (dry mouth, crowded teeth).

Epidemiology

Gingivitis is the commonest of periodontal diseases. It is more prevalent in males as compared to females since it has been found that females tend to follow better oral care regimes. It is commonly seen in children and adults. Studies have found gingivitis to be more prevalent in people with low socioeconomic status as people with high socioeconomic status tend to show a more positive attitude towards the maintenance of oral hygiene. Also, they have better access to health care options. Studies reveal that gingivitis is more prevalent in pregnant women as compared to non-pregnant women. Moreover, more severe forms of gingivitis have been more often seen in pregnant women [(15)]..

The most frequently seen types of gingivitis are plaque-induced, hormonal, acute ulcerative necrotizing, drug-induced, or spontaneously presenting hyperplastic gingivitis. Categorically, the more predominant form of gingivitis is plaque-induced. In fact, this type accounts for far more cases than all other variants combined[(16)].

Pathophysiology

Periodontal disease undergoes four different stages that were first explained by Page and Schroeder in 1976 [17].. Pathophysiologically, gingivitis has been divided into initial, early, and established stages, and periodontitis has been indicated as the advanced stage.

Initial Lesion

This stage is characterized by an acute exudative inflammatory response, a raised gingival fluid flow, and the migration of neutrophils from the blood vessel of the subgingival plexus located in the gingival connective tissue to the gingival sulcus. An alteration of the matrix of the connective tissue located next to vessels results in the accumulation of fibrin in the area. The initial lesion is seen within four days of the initiation of plaque accumulation. There is a destruction of collagen caused by collagenase and other enzymes secreted by the neutrophils. About 5% to 10% of the connective tissue is occupied by the inflammatory infiltrate in this stage[16].

Early Lesion

The early lesion is consistent with delayed hypersensitivity. It usually appears after one week from the beginning of plaque deposition. In this stage, the clinical signs of gingivitis, such as redness and bleeding from the gingiva start appearing. The inflammatory cells that predominate in this lesion are lymphocytes accounting for 75% of the total, and macrophages. A small number of plasma cells are also seen. Along with the inflammatory infiltration that occupies 5% to 15% of the connective tissue of the gingival margin, there is loss of collagen in the affected area that reaches 60% to 70%. Furthermore, the local fibroblasts undergo a series of pathological changes, and the gingival fluid flow and the number of leukocytes migrating to the region continue to increase. Neutrophils and mononuclear cells are also increased in the junctional epithelium. The duration of the early lesion has not yet been determined, it can remain for more time than previously expected[16].

Established Lesion

There is increased collagenolytic activity in this stage along with a rise in the number of macrophages, plasma cells, T and B lymphocytes. However, the predominant cells are plasma cells and B lymphocytes. In this stage, a small *gingival* pocket lined with a pocket epithelium is created. The lesion exhibits a high degree of organization. It has been suggested that the severity of gingivitis correlates with a growth in the B cells and plasma cells population, and a decrease in the number of T cells.

An established lesion may follow two paths, it can either remain stable for months or years; or progress to a more destructive lesion, which appears to be related to a change in the microbial flora or infection of the gingiva.

This stage has shown to be reversible after an effective periodontal therapy that results in an increase in the number of microorganisms associated with periodontal health that directly correlates with a reduction in the plasma cells and lymphocytes [16]..

Advanced Lesion

This stage is a transition to periodontitis. It is characterized by attachment loss that is irreversible. The inflammatory changes and the bacterial infection starts affecting the supporting tissues of the teeth and the surrounding structures such as gingival, periodontal ligament, and alveolar bone resulting in their destruction and may eventually result in tooth loss [18,19].

History and Physical

Healthy gingival tissue looks pink or pigmented in dark-skinned patients, firm, with no signs of redness or swelling, and with no bleeding after gently passing a periodontal probe along the gingival crevice. On periodontal probing, healthy gingiva shows less than 3 mm crevice and there is no bone loss on x-rays. In many instances, gingivitis may go unnoticed by the patient as the disease may exist and progress without any symptoms. When symptomatic, the patient usually gives a history of bleeding from the gingiva while brushing, flossing, and sometimes eating particularly hard food, along with halitosis that does not resolve even after performing oral hygiene. Physical examination of the oral cavity will reveal the presence of an inflamed and tender gingiva that usually bleeds on gentle probing. The gingival margins that show a knife-edge appearance and the gingival tissue with stippled aspect found in healthy gingiva are replaced by a more rounded and shiny aspect. Significant plaque and calculus deposits are usually seen.

In chronic gingivitis, the size of the gingival tissue may be increased towards incisal due to the edema or hyperplasia resulting in probing depths more than 3 mm; however, no attachment loss has occurred. These are known as false pockets.

The gingival swelling can be graded into four types.

- Grade 0: No signs of gingival swelling.
- Grade I: Swelling that is confined to the interdental papilla region.
- Grade II: Swelling involving both the interdental papilla and the marginal gingiva.
- Grade III: Swelling that covers three-fourths or more of the crown structure.

The Gingival Index (GI)

The purpose of the gingival index is to indicate the quality of the gingival tissue, differentiating the severity of the lesion, and the location of the alteration concerning the four areas that form the perimeter of the

marginal gingiva. The criteria included in the index are only related to qualitative changes in the gingiva. A score from 0 to 3 is given to each area of the tooth (mesial, distal, vestibular, palatine, or lingual), this is the GI for the area. The GI score per tooth is achieved by adding the scores from the four areas and then dividing this number by four. The GI for the subject is obtained by adding the indices of each tooth and dividing them into the number of teeth that were examined[20]..

Criteria for the gingival index system

0: Normal gingiva1: Mild inflammation – a slight color change, slight edema. No bleeding on probing.2: Moderate inflammation – redness, edema, and glazing. Bleeding on probing.3: Severe inflammation – marked redness and edema. Ulceration. Tendency to spontaneous bleeding [20]..

MATERIALS AND METHODS

Drug preparation:

Patoladi Kashya Gandoosha[21]. mentioned in *Astang Hrudaya* was prepared as *Kashaya* with ingredients of *Patola* 1 part, *Shunti* 1 part, *Trayanti* 1 part, *Triphala* 1 part, *Vishaala* 1 part ,*Tikta*1 part, *Haridra*1 part, *Daruharidra*1 part, *Guduchi* 1 part. *Kashaya* was prepared according to *Kashaya Paribhasha* of *Sharangadara Samhitha* the above mentioned drugs were taken in equal quantity and powdered in *khalva yantra* then 1 Part of drug was boiled with 16 part of water and reduce to 1/8$^{th.}$Part[22]. Then filter the *Kashaya* by using a kora cloth and allow to became luke warm. And add 5 ml of honey to it.This decoction was given for *Gandoosh*.

Place of study: Parul Ayurveda hospital, Vadodara, Gujarat

Case study:

A Female patient of age 42 consulted in parul Ayurvedic hospital shalakya tantra department with symptoms like *Raktsrav, Durghandha, Krushnta, Kledta, Mruduta in Dantmoola* since last 15 days. The case was diagnosed as *Sheetada* and was chosen for this study.

History of present Illness:

Patient was apparently normal before 6 months gradually patient developed with *Raktsrav* while brushing and eating hard particles, *Durghandha ,Krushnta, Kledta, Mruduta,* patient was not willing to take allopathic medicine so he came to PAH for better treatment .

- History of past Illness: She had a history of tobacco chewing since last 2 years.
- No history of D.M and HTN

On Examination:

- *Raktsrava* –Bleeding in gums was present, that was more on brushing time and while eating hard particles
- *Durgandya* – Bad odour was there while opening the mouth.
- *Krushnta* – slight reddish discolouration of gums

- *Kledta*- slight moister is present in gums
- *Mruduta*- slight spongy gum.
- Opening of mouth- Only up to 3 finger gap.

Assessment criteria: the assessment was done before treatment and after treatment also the follow up was done on the next day after the treatment.

Pharmacological properties of *Patoladi Kashya* [21,23].

BEFORE TREATMENT

Name of drug	*Rasa*	*Guna*	*Virya*	*vipaka*	*Karma*
(Patola	*Tikat Katu*	*Laghu Ruksha*	*Ushna*	*katu*	*Krimighna Sarvadosha Prashman*
Shunti	*Katu*	*Laghu snigdha*	*Sheet*	*Madhura*	*Kaph vata hara*
Guduchi	*Tikta kashayaya*	*Guru, Snigdha*	*Ushna*	*Madhur*	*Tridoshahar Dahprashman Rasayan*
Tikta	*Tikta*	*Laghu Ruksha*	*Sheet*	*Katu*	*Kapha pitta Hara*
Vishaala	*Katu Tikta*	*Lakhu,t ekshna*	*Ushna*	*Ushna*	*Pitta kapha Saamaka*
Haritaki	*Panch Ras*	*Laghu Ruksha*	*Ushna*	*Madhur*	*Tridoshhar Rasayan Bruhniya*
Vibhitaki	*Kashaya*	*Laghu Ruksha*	*Ushna*	*madhur*	*Kaphpitta Har Keshya*
Amalki	*Panch Ras*	*Laghu Ruksha*	*Sheet*	*Madhur*	*Rasayan Raktapitta har Kandughna*
Trayanthi	*Tikta*	*Laghu Ruksha*	*Ushna*	*Katu*	*Kapha vaata Samaka Pitta shodhaka*
Haridra	*Tikta Katu*	*Ruksha Laghu*	*Ushna*	*Katu*	*Tridosha Saamaka Pitta Rechaka*
Daru haridra	*Tikta Kashaya*	*Laghu Ruksha*	*Ushna*	*Katu*	*Tridosha Saamaka*

Treatment plan: Patient was treated in Ipd basis
Drug for Intervention – *Patoladi Kashyaya*
Form- *kwath*
Time – two times in a day
Duration- 7 days
Follow up 8th day

Treatment	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day
Raktmokshan	Done	Nil	Nil	Nil	Nil	Nil	Nil
Pratisaran	Done	Done	Done	Done	Done	Done	Done
Gandoosh	Done	Done	Done	Done	Done	Done	Done

AFTER TREATMENT

The sign and symptoms were assessed by scoring system, described in table.

Symptoms	Before treatment	After Treatment	On 8th Day
1.Rakta srava	++	Nil	Nil
2. Daurgandya	+++	Nil	Nil
3. Krishnta	+	Nil	Nil
4. Kledta	++	Nil	Nil
5. Mrudta	+	Nil	Nil

OBSERVATION:

It was observed that the patient got complete relief from Sheetada in 7 days. Patient was advised to maintain proper oral hygiene by brushing the teeth properly. And advised her to quit tobacco chewing as it is unhealthy.

DISCUSSION:

The study was aimed to evaluate the efficacy of Patoladi Kwatha Gandoosh in the management of Sheetada with special reference to Gingivitis. It is found that the drug is very effective in treating Sheetada. Gandoosh is a Procedure which helps in stimulation of salivary glands, maintains the oral Ph, Stimulates the taste buds and nerves, enhances the temperature in oral cavity and maintains the pressure in oral cavity. It also cleanses the mouth. All these helps in faster absorption of drugs in oral cavitys[(24)]..About the Patoladi Kashaya, most of the drugs in Patoladi Kashaya having the properties of Anti-inflammatory anti-bacterial, anti helmenthic and wound healing. These properties were helpful for reducing the symptoms of the patient[(25)]..All these conclusions are made after considering the theoretical and clinical aspects.

REFERENCES

[1] Prof. K.R .Srikanthamurthy, Susrutha Samhita Nidanasthana; published by Chaukhambaha Orientalia 2008, pg no:565.

[2] Prof. K.R .Srikanthamurthy, SusruthaSamhita Nidanasthana; published by Chaukhambaha Orientalia 2008, pg no:566.

[3] Cheppattu achutha warrier, Ashtanga Hridayam Uttarasthana, Published by Devi book stall, 12th edition, 2008, Page no;35

[4] Kaviraj Govind Das Sen Bhaisajya Ratnavali Published by Chaukhamba Surbharti Prakashan Varansi 2019 edition page no. 903.

[5] Marchesan JT,Girnary MS,Moss K,Monaghan ET,Egnatz GJ,Jiao Y,Zhang S,Beck J,Swanson KV, Role of inflammasomes in the pathogenesis of periodontal disease and therapeutics. Periodontology 2000. 2020 Feb; [PubMed PMID: 31850638]

[6] Trombelli L,Farina R,Silva CO,Tatakis DN, Plaque-induced gingivitis: Case definition and diagnostic considerations. Journal of periodontology. 2018 Jun; [PubMed PMID: 29926936]

[7] Trombelli L,Farina R,Silva CO,Tatakis DN, Plaque-induced gingivitis: Case definition and diagnostic considerations. Journal of clinical periodontology. 2018 Jun; [PubMed PMID: 29926492]

[8] . Bosma-den Boer MM,van Wetten ML,Pruimboom L, Chronic inflammatory diseases are stimulated by current lifestyle: how diet, stress levels and medication prevent

our body from recovering. Nutrition [PubMed PMID: 22510431]

[9] Dickinson S,Hancock DP,Petocz P,Ceriello A,Brand-Miller J, High-glycemic index carbohydrate increases nuclear factor-kappaB activation in mononuclear cells of young, lean healthy subjects. The American journal of clinical nutrition. 2008 May; [PubMed PMID: 18469238]

[10] Hu Y,Block G,Norkus EP,Morrow JD,Dietrich M,Hudes M, Relations of glycemic index and glycemic load with plasma oxidative stress markers. The American journal of clinical nutrition. 2006 Jul; [PubMed PMID: 16825683]

[11] Gürsoy M,Gürsoy UK,Sorsa T,Pajukanta R,Könönen E, High salivary estrogen and risk of developing pregnancy gingivitis. Journal of periodontology. 2013 Sep; [PubMed PMID: 23237582]

[12] Bilińska M,Sokalski J, [Pregnancy gingivitis and tumor gravidarum]. Ginekologia polska. 2016; [PubMed PMID: 27321105]

[13] . Nakagawa S,Fujii H,Machida Y,Okuda K, A longitudinal study from prepuberty to puberty of gingivitis. Correlation between the occurrence of Prevotella intermedia and sex hormones. Journal of clinical periodontology. 1994 Nov; [PubMed PMID: 7852609]

[14] Tungare S,Paranjpe AG, Drug Induced Gingival Overgrowth StatPearls. 2021 Jan; [PubMed PMID: 30860753]

[15] . Kashetty M,Kumbhar S,Patil S,Patil P, Oral hygiene status, gingival status, periodontal status, and treatment needs among pregnant and nonpregnant women: A comparative study. Journal of Indian Society of Periodontology. 2018 Mar-Apr; [PubMed PMID: 29769772]

[16] 16. Page RC, Gingivitis. Journal of clinical periodontology. 1986 May; [PubMed PMID: 3522644]

[17] . Page RC,Schroeder HE, Pathogenesis of inflammatory periodontal disease. A summary of current work. Laboratory investigation; a journal of technical methods and pathology. 1976 Mar; [PubMed PMID: 765622]

[18] Bosshardt DD,Selvig KA, Dental cementum: the dynamic tissue covering of the root. Periodontology 2000. 1997 Feb; [PubMed PMID: 9567923]

[19] . Syndergaard B,Al-Sabbagh M,Kryscio RJ,Xi J,Ding X,Ebersole JL,Miller CS, Salivary biomarkers associated with gingivitis and response to therapy. Journal of periodontology. 2014 Aug; [PubMed PMID: 24502627]

[20] Löe H, The Gingival Index, the Plaque Index and the Retention Index Systems. Journal of periodontology. 1967 Nov-Dec; [PubMed PMID: 5237684]

[21] Cheppattu Achutha warrier, Ashtanga Hridayam Uttarasthana, Published by

Devi book stall, 12th edition,2008,pageno;64

[22] Prof. K.R. Srikanthamurthy, Sharangadhara Samhita, madhyama khanda, published by chaukhambha orientaliya,page no:86

[23] Acharya Priyavartha Sharma, Dravyaguna vijnana, Published by chaukhambha Bharathi academy,2006.

[24] https://www.ayurvedagram.com

[25] https://www.iamj.in