

DISCUSSION

Discussion on demographical Data :

Age: Eligibility criteria for patients for the study between 30-70 years. 36% Patient belongs to the age group of 50 - 70 years in group A, followed by age group of 40 - 50 & 30 -40 years of age group. This indicates that the disease Jānusandhigata Vāta is known fact in the old age group. After reaching the age of 50 there was natural degeneration of the Śārira Dhātu and Bala which in turn aggravates the Vāta generating the pathology . 40% patients were found in 30- 40 yrs. of age in group B, its due occupational knee bending and obesity.

Gender: 76% of the patients of this study were females and remaining was male. Even the universal data says the prevalence of osteoarthritis is more in elderly women. In females, menopause contributes the degenerative changes. Even in males the degenerative process starts from the age of 50.

Prakrūtī : 38% were belonged to Vāta-Pitta Prakrūtī in Group A.58% patients were Vāta –Pitta Prakrūtī found in Group. It specifies that Asthi Kṣay is more common in Vata –Pitta Pṛadhāna Prakrūtī .

Āhar: In this study most of the patients were found Non- Vegetarians i.e.82% in Group A.86% pts were found Non-vegetarians in Group B respectively. Adhyaṣan causes Paratantra Vāta Prakopa.

Occupation: In the study majority i.e. 54% of the patients were from housewives group followed by worker i.e. 30 %. This conceal that most of the etiological factors of the Jānusandhigata Vāta are found in house wife’s group , because of housewives physical loading on Knee joint and continues standing work.

Vyasan: In this i.e. 30 % patients were found Vyasan of tobacco chewing and 70% patients there were no any Vyasan found in this study. It might be due to random selection of the patients .

Marital status: 96% of the patients were married. This might be because of the age factor of the patients above the age of 30 were taken for study.

Nidān: Maximum number of patients were found Ubhyajānusandhigata Vāta (osteoarthritis both knee joint) i.e. 94 % and 82 % in both group respectively.

Avasthā: In the study maximum number of patients were found with Nirupstambhita Jānusandhigata Vāta i.e. 80% in group A and 70% Group B respectively.

Other findings: Most of the Patient in this large sample size has history of Cinta, Krodha due to work load, family and other problem.

Discussion on Jānusandhigata Vāta :

Among the Tridoṣas Vāta being the prime plays a very important role in the formation of Vyādhī as it is the one which carries the two Doṣa all over the body .Vāta moves all over the body which can be attributed to its Cala Guṇa . When the Prakupita Vāta moves all over the body it finds a suitable place for lodgment, which may be Dhātu , Upadhātu , Āśaya ,Avayava or Mala. Due to consumption of Vāta Āhār Vihār, the aggravated Vāta while moving throughout the body lodges in Khavaigunya Yukta Srotas. After getting stuck at those parts,it impairs the functions of that particular structure and produces Vyādhī .

In Āyurveda, Sandhi is the place where two or more structures unite together. In the present context Sandhi can be considered as union of two or more bones .Along with bones there are many other structures which combine together to form a Sandhi. Asthi, Snāyu and Peṣī all combine together to bring stability in the Sandhi. Śleṣaka Kapha present in the joint helps in lubrication and provides nutrition to the joint.

Sandhigata Vāta is described in all Saṃhītā and Sangraha Grantha under Vāta Vyādhī and when Jānu Sandhi is involved it may be called as Jānu Sandhigata Vāta .It specially occurs in Vriddhāvastha where Dhātu kṣaya takes place which leads Vāta Prakopa.Vāta and Asthi have Āṣṛaya-Āṣṛayī Saṃbadha which means Vāta takes shelter in Asthi. Prakupita Vāta reduce the Sneha from Jānu Sandhi by its opposite qualities to Sneha. Due to diminution of Sneha, Khavaigunya occurs in Asthi and the Sandhi which is responsible for the production of Sandhigata Vāta .

Symptoms of Sandhigata Vāta as described by various Ācāryās are Sandhi Śūla, Sandhi Śoṭha ,Sandhi Ātopa, Ākuncana- Prasāraṅjanya Vedanā ,Sandhispuṭan and Sakaṣṭacalan occurs due to Vāta Prakopa. A special type of Śoṭha i.e. Vātapurnadritīsparśa is mentioned which indicates Vāta dominant Śoṭha¹ . Ānkunchana-Prasāraṅjanyaoho

Vedanā and Hanti Sandhi occurs due to Kaphakṣaya and Vāta Prakopa. In the Saṃprāptī of Sandhigata Vāta , Prakupita Vāta takes Shelter in Sandhi where Khavaigunya and Rikta Srotas is already present. Then Doṣa Duṣya Sammurccanā takes place in Sandhi and the disease Sandhigata Vāta appears with its symptoms.

By nature all the Vāta Vyādhī are difficult to cure and they are said as Mahāgada. Sandhigata Vāta . Hence being Vāta Vyādhī , Jānu Sandhigata Vāta is Kaṣṭha Sādhya, present in Madhyam Rogmārga, involving Marma Asthi Sandhi and Vitiation of Asthi and Majjā Dhātu. Jānusandhigata Vāta is a disease where the painful restricted movements of the Knee joint are seen. In the Saṃprāptī of Sandhigata Vāta , Prakupita Vāta takes place in Sandhi where Khavigunya and Rikta Srotas is already present. Doṣa Duṣya Samurccanā takes place in Sandhi and the disease Sandhigata Vāta appears with Symptoms. Thus vitiated Vāta along with Kapha produces Śūla ,Sotha, Ātopa,Sakaṣṭacalan ,Ākuncanjanya and Prasāranjanya Vedanā in localized part.

Ācārya Caraka has mentioned repeated use of Snehan and Swedan , Basti and Mrudu Virecan for the treatment of Vāta Vyādhī² . Ācārya Caraka has not mentioned the treatment of Sandhigata Vāta separately. Ācārya Suśrūta has described specific treatment of Sandhigata Vāta first time i.e. Snehana , Upanāha , Agnikarma, Bandhan and Unmardan³.

There are many clinical conditions described in modern medical texts, which involves the Knee joint, among which the most common condition is Osteoarthritis of Knee. In i.e. 80 % the pathology is found in the Knee joint. The factors like old age, Obesity, trauma, occupational Knee bending , poor posture , continues Standing , excessive work ,travelling etc. lead to the degeneration of bones and related joint structure resulting arthritic changes in the Knee Joints. Owed to degeneration and osteophytes modifications in the knee joint leads to the Knee joint Pain, restriction of the movements of the Knee joint occurs crepitus and difficulty during walking.

Osteoarthritis is a degenerative type of arthritis which mainly occurs in old age. Degeneration takes place in the joint which makes the individual disabled or handicapped. Degeneration occurs continuously in most of the patients which makes the person disabled lifelong .It is a chronic degenerative disorder of multifactorial etiology characterized by loss of articular cartilage and per articular bone remodeling .It involves

the entire joint including the nearby muscles, underlying bone, ligament, synovium and capsule. The risk factors for osteoarthritis are old age, obesity, in Female, major trauma, stress, genetic factors, prior inflammatory joint disease and metabolic or endocrine disorder. It is believed that once the disease osteoarthritis has taken place, then it is very difficult to reverse or block the disease process. Till date, no management is available that can reverse or slow or block the disease process. Modern Science has only palliative and joint replacement treatment for osteoarthritis.

Jānusandhigata Vāta is a disease caused by Vāta Vrudhi and Kapha Kṣaya. Jānubati and Agnikarma were the ideal line of treatment. The Jānubati (Snehan and Swedan) with Sahacar⁹ have their antagonist properties acts the potentials of Vrudha Vāta and help in alleviating the Vāta Doṣa. Snehan also helps in bringing back the Kapha Doṣa regularity⁸.

Keeping an eye on this ideology; the present study was planned Jānubasti with Sahacar Taila and Agnikarma with Tāmraśalākā.

Snehan by Jānubasti - Abhyanga directly acts on muscles and makes them strong⁴. The root of Mamsavaha Srotas is Snayu (ligaments), Tvacā (skin)⁵. Therefore, Abhyanga is done over Tvacā and Snāyu and also it involves Raktavahini. Hence here, direct benefit is achieved at Maṃsavaha Srotas. Abhyanga nourishes deeper Dhātu also. Here, one thing we can say that Jānubasti makes the muscles strong and thus get the stable of knee joint.

Swedana (fomentation): Swedana is Sandhiceṣṭakar (improves the movements of joints), Srotośudhīkar (clears up the micro channels), Agni Dīpaka, Kapha Vāta Nirodhan (antagonist of Kapha). It decreases Sthambha (stiffness)⁶. Heat administration by Swedana may produce analgesic effect by diverted stimuli.

In Sandhigata Vāta, Sanga type of Srotoduṣṭī is present Swedana, by doing Srotośudhi, this Sanga is relieved.

Agnikarma : Properties of agni are Sukṣma, Laghu, Tikṣṇa, Uṣṇa Guṇa and Āṣūkārī⁷. It works on both Vāta and Kapha dosa. It works on Vāta by its Uṣṇa and tikṣṇa guṇa and on the kaphadoṣa by laghu, sukṣma, tikṣṇa and Uṣṇa Guṇa. It works deep in the tissue because of its power of penetration to deep tissue by virtue of Laghu, Sukṣma and Tikṣṇa Guṇa. Besides working on the Doṣa Agni it also destroys the dead tissue on wound

surface by its mechanical burn causing thermal injury. In this way it promotes the healing in chronic non healing wounds. Thus, here we can consider that Jānubasti with Sahacar Taila and Agnikarma with Tāmraśālākā useful in Nirupstambhita as well as Upatambhita Jānusandhigata Vāta.

Discussion on procedure of Jānubati:

In the present the following observation were analyzed;

1. Quantity of oil required:

It was observed during the study that for bilateral Knee minimum of 150-200 ml of oil was required for three days including the wastages and again for next four days fresh oil of 150-200ml was used. Hence on an average of total oil 400-500 ml oil needed for smooth conduction of the procedure for 7days.

2. Quantity of flour :

During the study it was observed that a maximum Māṣapiṣṭī for both knees and average of 300 gram of flour is required. The dough once used can be preserved or can be reused. Nearly 1kg of flour was sufficient to carry out the procedure.

3. Height of Jānubasti Pit :

As Jānu is an irregular area the basti has to be constructed with due to care and try to accommodate larger surface area as possible. Hence, it is advised and easy to use a still rim for support. On an average the pit should 3-4 inch height to submerge the whole of Jānu.

4. Temperature of oil:

One has to be very cautious while maintain temperature of the oil as it may causes scald when hot oil is poured. It is advised to pour the oil along the wall of the basti rather than pouring it directly on the skin. On an average a temperature of 40-45° C was well tolerated by the patients. During the period of 30 minutes the oil was replaced for times.

5. Duration of the procedure:

In the present study the duration of procedure was fixed to 30 min looking at the convenience of the patients as it very difficult to stay in the same position for long time. The procedure was done once in a daily as it was difficult to convince the patient to stay IPD.

Discussion on procedure of Agnikarma:

The following observation were analyzed;

1. Temperature of Tāmraṣalākā:

Tāmraṣalākā was heated for 5minute it becomes red hot. Agnikarma were done marked maximum tenderness site and up to the expected extent of the burn, which can cause the Samyak Dagdha Lakṣaṇa, without any Upadrava.

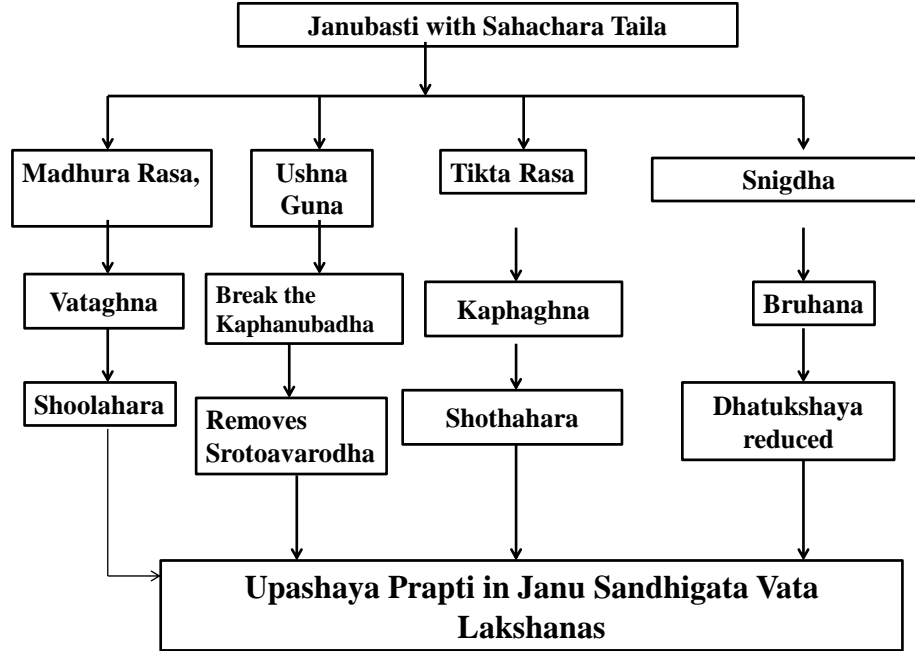
2. Binduvat seating:

Agnikarma was done 5-6 Binduvat seating per day. Distance between each bindu was kept 5 mm constant. Total maximum area tenderness of knee joint was covered in 7 days.

3. Duration of Agnikarma Procedure:

In the present study the duration of procedure was fixed for one Binduvat seating within 5-10 sec. looking at the convince of the patients as it is very difficult to bare Daghdha .

MODE OF ACTION OF JĀNUBASTI:



Suṣṛūta has explained the same mode of absorption of the Sneha applied over the Skin. Sneha go through the skin to Roma, Kupa, Twak, Rasa, Rakta, Mamsa, Meda, Asthi and Majja through settle channels and diminishes the Vata Pitta Kaphaj Disorders⁸. Thus by above references it can be said that the Taila used in Jānubasti gets absorbed through skin and acts according to properties of Sahcar Taila.

The Vāta Doṣa, which is the key factor in the causation of Jānusandhigata Vāta, has almost opposite quality of Sahacar Taila. Moreover properties of Shacar Taila has opposite to that of Kapha Doṣa. In Jānusandhigata Vāta Sthānika Kapha Kṣya is due Āgantū Vāta Doṣa. Thus on one hand Sahacar Taila neutralizes the Kapha Doṣa and on the other hand nourishes the Sthānika Vāta Doṣa, which lead to Saṃprāpti Vighatan.

Śūla is one among the features of Jānusandhigata Vāta which is almost present in all the patients. The properties of Sahacar Taila such as Snigdha Guṇa and Madhur Rasa, are totally opposite to the assets of Vāta. Thus these properties of Sahacar Taila acts against Vāta and help in subsiding the Śūla. The heat applied by the procedure do the Chedan

and Visrāvaṇ of the Duṣya involved in the formation of **Śoṭha** . Owing to this action the Śoṭha is reduced.

Sparśāsahatva diminishes by Śūlahar and Śoṭahar properties of Sahacar Taila. **Ākunchanjnya- Prasāraṇajnya Vednā** (Joint stiffness) is also a feature in Jānusandhigata Vāta which is caused by the Śīta Guṇa of Vāta. The heat applied through the retention of Taila the procedure tackle this Śīta Guṇa and reduce the Stiffness of joint. The relief in the stiffness of joint increase the Sandhi Gati Sāmṛthya and helps the range of movement of knee joint.

Ātopa (Sandhispuṭana) is due to Vāta Prakopa and Sthānika Kapha Kṣaya .This is owing to Khara ,Rukṣa and Viṣad Properties of Vāta . Snigdha ,Picchila and Mruda qualities of Sneha Dravya which are oppose to the qualities of Vāta , and helps in reducing the Ātopa. As Ātopa is caused due to the long term overuse of joint it needs Snehana for long duration. Ātopa cannot be corrected in Short period of time.

“**Sahacaram**” means walking along with. As Sahacar Taila⁹ is having specific property like (Madhur & Tikta Rasa) Gati viseshatvam (helps to move) it can be given in condition like the disease having **difficulty in walking**, pain, swelling ,tenderness and stiffness.

Bāhyasnehan (external application of oil) is mentioned as one of the therapeutic measures in curing various types of Vāta disorders. External application of Sahacara Taila with Jānubasti helps curing Vāta disorders quickly and effectively due to its Vātahāra as well as Bruhaṇa (nourishing) and Pāchan properties.

All the contents of Sahacar Taila are Uṣṇa in nature so it diminishes vitiated Vāta and resolves the symptoms of Jānusandhigata Vāta due to aggravated Vāta.

All these properties of Sahacar Taila help in Samprapti Vighatana and prevent Kha Vaigunya which is the main factor for Jānusandhigata Vāta. Therefore we can determine that Sahachar Taila beneficial in Upasthṁbhita as well as Nirupstambhita Jānusandhigat Vāta.

Jānubsti is a procedure evolved from Śiro Basti¹⁰. It is a kind of Bāhya Snehana and Swedan procedure . Snehana mainly acts against the Rukṣa Guṇa caused by Vāta and Swedan mainly acts against the Śīta Guṇa .It also reduces the Stambha and Gaouratā.

Suṣrūta explains that out four Triyaka Dhamanī, each Dhamnī dived into hundred and thousand times and become innumerable. These Dhamnī form a network and spread all over body¹¹. They have their opening in the Loma Kūpa . The Dravya applied over the skin is absorbed through these openings and undergo Pācan by the help of Bhrajaka Pitta which is situated in the skin .The Dravya can be applied in various forms such as Abhyang , Pariṣeka, Avagāha, Ālepa etc. All the drugs applied in any form undergo Pācan. Sneha and Abhayng give Strength and Stability to Sandhi¹².

Drug Absorption:

The principle fence for absorption of exogenous material through the skin is stratum corneum . Pace of absorption is directly proportional to concentration of drug in Vehicle ,partition ,co-efficient , diffusion co-efficient and thickness of stratum corneum .The Physiological factors that affect per cutaneous absorption include hydration ,occlusion, age, intact versus disrupted skin ,temperature and anatomical site.

Among vehicles greases are anhydrous preparations that are either water insoluble or fatty. Fatty agents are more occlusive than water-soluble. They restrict transepidermal water loss and hence preserve hydration of the stratum corneum.

Absorption depends upon lipid solubility of the drug since the epidermis acts as a lipid barrier .The dermis however is freely permeable to many solutes .Suspending the drug in an oily vehicle can enhance absorption through the skin . Because hydrated skin is more permeable than dry skin.

Mode action externally applied Taila in OA :

- Phospholipase A2 is an inflammatory enzyme found in synovial fluid of OA.
- The linoleic acid and oleic acid in Taila blocks the phospholipase A2 enzyme thus reducing the inflammation in osteoarthritis¹³ . The anti-arthritic effect of fraction (EABP) of chloroform extract of *B. prionitis*, established in this study could be attributed to the presence of flavonoids, triterpenoid, saponins, tannins and steroids detected after phytochemical screening of the fractions. Triterpenoids are known to inhibit histamine release from mast cells and exert anti-inflammatory effects. Non-specific anti-arthritic activity may be due to the combined effect of the different phytoconstituents present.

- The anti-arthritic potential of EABP may be through protection of synovial membrane, vascular permeability, prevention of cartilage destruction, thereby improving the health status through hematinic properties. The effect may be due to the inhibition of phospholipase A2 and prostaglandins due to similar effect of diclofenac¹⁴.

Effect of application of Heat:

The application of heat to the body is called thermotherapy.

There are two types of heat effects:

1)Local effect

2)Systemic or general effect

1. Local effect :

- Increase metabolic rate
- Increase blood flow (hyperemia)
- Improve fluid dynamics
- Pain control
- Decrease muscle spasm
- Increase tissue elasticity

2.Systemic or general effect:

The following systemic effects occurs when large area of the body or entire body is exposed to heat.

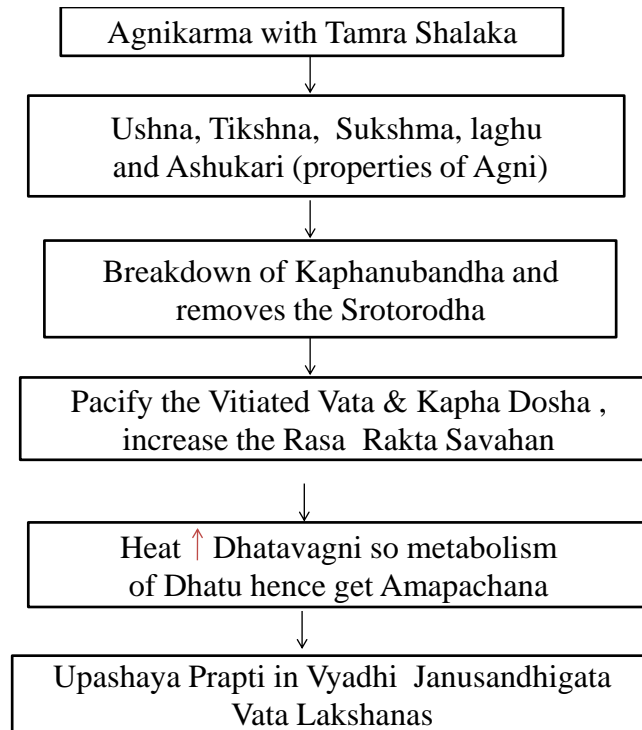
- Generalized skin vasodilatation
- Generalized sweating
- Increase pulse rate
- Increase respiratory rate
- Decrease blood pressure

Application of medicaments, heat and massage definitely helps in eliminating the number of noxious elements through skin .The application of heat in different forms of Swedan promotes local circulation and metabolic actives and also opens the pores the skin to permit transfer of medicaments and nutrients towards to needed sites and elimination of vitiated Doṣa and Mala through skin and perspiration.

The application of heat on skin induces increased metabolic activity ,increased circulation and stimulation of nerve endings on skin and tissues .It also has many indirect effects in the body mechanism.

The metabolic activity is increased in the part where more heat is applied .This increased metabolism creates demand for oxygen and nutrients.

MODE OF ACTION OF AGNIKARMA:



Ayurvedic principles state that being Uṣṇa treatment acts against the qualities of Vāta and Kapha Doṣas and hence cures all the Vātaj and Kaphaj disorders, even it helps to remove Srothosangha and Āvarana by Uṣṇa Guṇa .

Agnikarma cures all the Vātaj and Kaphaj disorders as Uṣṇa Guṇa of Agnikarma is apposite to that of Vāta Kapha Doṣa. According to Ayurveda every Dhātu ,Have its own Dhāt-wāgni ,when it becomes low, disease begins to manifest. In this condition ,Agnikarma works giving external heat there by increasing Dhāt-wāgni which helps to digest aggravated Doṣas and hence cures the disease¹⁵ . The local thermotherapy may

increase local metabolism which may leads to excretion unwanted metabolites and toxins. Heat may stimulates lateral spinothalamic tract (SST) which leads stimulation of descending pain inhibitory tracts (DPT) which release endogenous opioid peptide which bind with opioid receptors at substantia nigra which inhibit of release of P-substance (Pre – sympathetic- inhibition) blockade of transmission pain sensation occur¹⁶.

Effect of temp changes on the body tissues. The changes that occur in the living tissues on contact with heat are follows^{17,18}.

- **Effect of metabolic activity:**

The rate of any metabolic activity is increased by rise in temp (Dr.Vant Hoff's law) in living organism increasing temperature tends to denature proteins and thus interference with enzyme controlled metabolic process. At temp above 45° C so much tissues destruction occurs, from the therapeutic point of view with an appropriate temperature ,all activity increases, including cell motility and synthesis. Furthermore, the rate of cellular interactions, such as phagocytosis or growth is accelerated.

- **Collagen changes in the tissues :**

It has been shown that collagen melts at temperature above 50° C. At temperatures within a therapeutic applicable range (40° C -45° C) Extensibility of tissue has been shown increase. Therefore it becomes evident that joint stiffness reduces by heating.

- **Nerve stimulation:**

Heat and cold stimulates the sensory receptors of the skin since there sensations can be recognised. Afferent nerves stimulated by heat may have an analgesic effect by acting on the Gate mechanism.

- **Changes in blood vessels:**

With skin heating vasodilatation occurs not only to distribute the addition heat around the body , but also to protect the heated skin. The skin surface naturally heated from the outside and heat conduction is not affected through substances fatty tissues. Vasodilatation by heat is caused by several mechanisms. There will be a direct effect on capillaries, arterioles and venules, causing them all to dilate. Increased metabolism will lead to further release of Carbon Dioxide and lactic acid ,leading to greated acidity of the

heated tissues provokes dilation. Heating can damage proteins, this may initiate an inflammatory response due to the liberation of histamine like substances.

- **Effect of Viscosity:**

The resistance to flow in a bold vessel depends directly on the viscosity of the liquid and inversely on the fourth power the radius of the vessels. Raising the temperature in liquids lowers its viscosity. Viscosity Changes affect not only the fluids in narrow vessels (blood and lymph) but also a fluid movement within and throughout the tissues spaces. This increase the rate of circulation and thereby acts as anti-inflammatory in chronic lesion. Thus when heat is applied to the skin surface little heating of dipper tissues occurs because they are shielded by the thermal insulation provided by the subcutaneous fat and the fact that heat is removed in the increased skin blood flow. However some conduction to the local deep tissues does occur. Since the effects are largely confirmed to the skin for deeper conduction it is responsible to propose material which are ;having for Agnikarama more heat conduction capacity for long periods. Though Tāmra Dhātu Śalākā has considerable higher temperature than that of other material, when employed for Agnikarma. Tāmraśalākā Agnikarma is Rukṣa type of Agnikarma it gives result in Sirā Snāyu Asthi and Sandhi¹⁹.

Endorphins²⁰ :-

Endorphins a group of proteins occurring in the brain and having pain-relieving properties. The term endorphin is generic, referring to all the opioid peptides, while specific peptides are given individual names, such as the enkephalins and β-endorphin. They are co-released with norepinephrine in response to stress, among other stimuli.

Agnikarma stimuli that release ACTH, a stress hormone which in turn induces the adrenal gland to release steroids, also co-release β-endorphin at the same time. Stimuli that release ACTH and norepinephrine also release both β-endorphin from the pituitary and enkephalins from the substantia gelatinosa, adrenal so the perception of pain decreased

Counter Irritation Theory:-

Theory suggest of that exited nociceptors are inhibits in the dorsal horn When Agnikarma is done on the site of pain thermoreceptor is stimulated.

Proximal branch of the thermoreceptor in the dorsal horn activate interneuron that synapse on the excited nociceptors (in dorsal horn). These interneuron release the neurotransmitter Enkephalin. Enkephalins bind with the excited nociceptors and diminish the release of P-substance.

Enkephalins binding on the excited nociceptors, inhibits the transmission of nociceptor signal, thus decreasing the sensation of pain.