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## AN ANALYTICAL STUDY ON THE CLINICAL EFFICACY OF PEENISA PUGAI TOWARDS THE MANAGEMENT OF PEENISAM (SINUSITIS)

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Siddha medicine,  
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**ABSTRACT:** Pugai (fumigation) is one among the external medicines in treating a variety of diseases with the fumes of herbs or aromatic substance. Peenisa pugai is an external therapeutic measure that has been indicated in Siddha literature for the effective management of Peenisam that can be symptomatically correlated with that of Sinusitis. The aim of the present Pilot study was to compare the efficacy of internal therapy alone (Gowrisinthamani chendooram and Thirikaduku chooranam) with that of internal therapy in combination with Peenisa pugai. The clinical study was conducted at Ayothidoss Pandithar hospital, National Institute of Siddha, Chennai- 47. In this study, 60 patients with sinusitis were divided into two groups Group A and Group B. Group A (30 Patients) were administered with internal medicine alone (NIS OPD Medicine) & Group B included 30 patients with internal medicines along with Peenisa pugai. Pugai was externally administered for 10 min with the time interval of 5 days up to 5 sittings. The Prognosis of each patient was assessed by Friedman and katsantonis staging protocol. The results showed that the group B patients with both external and internal therapy showed good prognosis than group A.

**INTRODUCTION:** Acute sinusitis is characterized by sudden nasal blockage followed by discharge, facial pain, and reduction in smell in adults or cough in children. It is a common ailment throughout the globe with a global prevalence of 6-15% <sup>1</sup>. Approximately 0.5% of all upper respiratory tract infections are complicated by sinusitis, and the incidence rate ranges from 15 to 40 episodes per 1000 patients per year <sup>2</sup>.

Even though there is reliable evidence of several resolutions and recommendations to restrict antibiotics to severe illness due to the emerging increase of antibiotic resistance, more than 80% of people in Europe and North America and 30% in Asia with Sinusitis receive antibiotics.

Presently the response to antibiotics, is disappointing. Therefore, it is worth to concentrate on relieving the symptoms of acute sinusitis such as maintenance of adequate hydration to loosen secretions, application of warm facial packs to help promote drainage of mucus, administration of analgesics for the localized pain and tenderness and use of decongestants to increase ostial diameter and promote sinus drainage and use of saline nose drops to provide moisture and improve mucociliary

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function as suggested by several modern medicine texts. Unfortunately, no good-quality trials have been done to show that any of these measures are effective<sup>3</sup>.

The traditional Siddha System of Medicine is being used to treat various types of diseases consisting of Herbal, Mineral, and Animal sources. The treatment methods consist mainly of two pillars, namely Agamarunthu (Internal medicine) and Puramarunthu (External Medicine), both of which includes 32 types. Pugai (fumigation) is one among the 32 types of external medicines, in treating various types of diseases as inhalation therapy. According to Theraiyar Tharu, Pugai is the most excellent procedure not only for treating diseases and used for disinfection and sterilization in the surrounding environment<sup>4</sup>. Pugai represents the artificial impregnation of the atmosphere, with the fumes or the smoke of any herbal or aromatic substances. Siddhar's colossal knowledge implies that Pugai has been used to treat various chronic challengeable diseases.

It is the best procedure employed for disinfection and sterilization methodology for the treatment of sinusitis, constricted respiratory pathways, chronic ulcers, toothache, headache, dysmenorrhoea, anorectal diseases, dental cavity, fever, arthritis, halitosis, dandruff, and few chronic skin diseases<sup>5</sup>. However, there exist lacunae in the practice of external therapies among Siddha physicians as there are several unexplored areas and ignorance about the traditional methods. This analytical study on the clinical efficacy of Peenisa pugai in treating Peenisam was performed to explore the scientific fumigation methods and medicines towards the management of Sinusitis.

**MATERIALS AND METHODS:** The clinical study was conducted at Ayothidoss Pandithar hospital, National Institute of Siddha, Chennai- 47 after obtaining the IEC (NIS/IEC/10/2016-17/44-20.05.2016) in 60 patients with sinusitis and were divided into two groups Group A and Group B. Group A (30 Patients) were administered with internal medicine alone (NIS OPD Medicine) & Group B included 30 patients with internal medicines along with Peenisa pugai. Pugai was externally administered for 10 min with the time interval of 5 days upto 5 sittings. The clinical trial

was registered in CTRI REF/2016/08/011954 before conducting the study.

**Selection Criteria:** Patients reporting with the symptoms of Peenisam were selected for the study, according to inclusion and exclusion criteria. Both male and female patients of age 18-60 years were selected with the following symptoms. Patients with symptoms of postnasal drip, discolored nasal discharge (greenish in color), nasal stuffiness or congestion, tenderness of the face (particularly under the eyes or at the bridge of the nose), frontal headaches, pain in the teeth, cough, fever, Fatigue and Bad breath, those diagnosed with frontal sinusitis and Maxillary sinusitis using Imaging techniques and willing to give consent for study participation were selected. Patients under 18 years, cardiac disease, allergic asthma, epilepsy, ethmoid sinusitis, sphenoid sinusitis, any other serious illness, and those who were not willing to participate in the study were excluded from the study.

#### Study Drug:

**Internal Medicine:** Gowri sinthamani chendooram was given in a dose of 200mg bid and Thirikaduku chooranam 2 tablet twice a day with honey as adjuvant for 24 days. NIS OPD medicine is the drug source.

**External Medicine:** "Peenisa pukai" the ingredients of Peenisa pugai are Thippili (*Piper longum*), Manjal (*Curcuma longum*), Omam (*Carum copticum*) and Milaku (*Piper nigrum*)<sup>6</sup>. The above ingredients ground well into the powder which was then applied on the pure cloth and rolled into small wicks of 6-8 cm **Fig. 1**.

**RESULTS:** In this analytical study, 60 patients with sinusitis were divided into two groups Group A and Group B. Group A (30 Patients) were administered with internal medicine alone (NIS OPD Medicine) & Group B included 30 patients with internal medicines along with Peenisa pugai. Pugai was externally administered for 10 min with the time interval of 5 days upto 5 sittings. The Prognosis of each patient was assessed by Friedman and katsantonis staging protocol (Score 0-No discharge, Score 1- Clear and thin discharge, Score 2- Thick and purulent discharge), Blood parameters such as ESR and AEC.



FIG. 1: HERBAL INGREDIENTS AND PROCEDURE OF PEENISA PUGAI

TABLE 1: ASSESSMENT OF SYMPTOMS SCORE AND BLOOD PARAMETERS BEFORE AND AFTER TREATMENT

Parameters	Before treatment Mean±Std		After treatment Mean±Std		P-Value	
	Group A	Group B	Group A	Group B	Group A	Group B
Symptoms score	1.4±0.67	1.76±0.43	1.1±0.71	0.4±0.62	0.0014*	<0.0001**
ESR	26.46±17.9	32±22	19.13±13.0	16.46±8.8	0.0008*	<0.0001**
AEC	371.8±193.5	310.87±160.6	412.4±285	241.6±120	0.0313*	0.0004*

P-value <0.05 is considered to be statistically significant. \*- Statistically significant \*\*- Highly significant

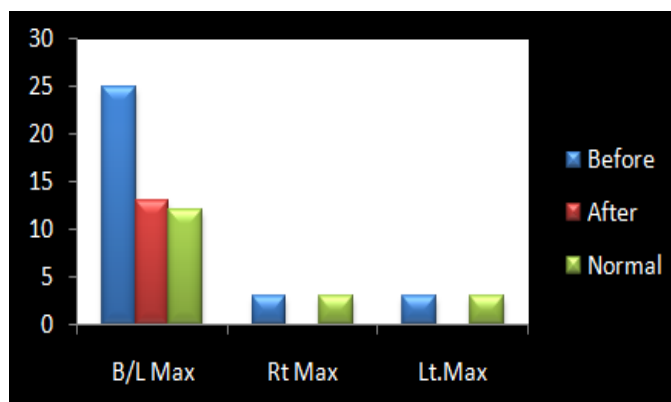


FIG. 2: GRAPHICAL REPRESENTATION OF X-RAY IN GROUP A (INTERNAL MEDICINES ALONE-TKC+GCI)

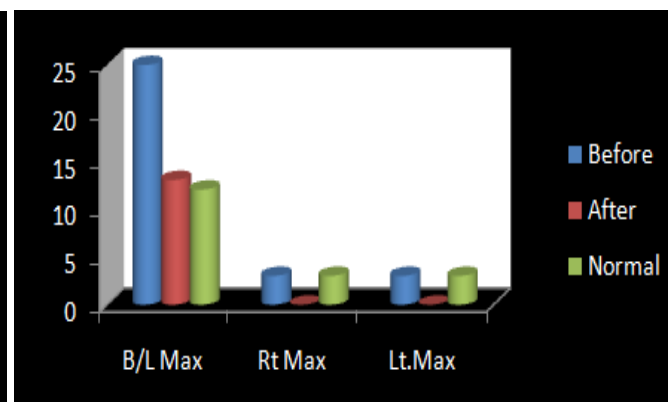


FIG. 3: GRAPHICAL REPRESENTATION OF X-RAY IN GROUP B (INTERNAL MEDICINES WITH EXTERNAL THERAPY (PEENISA PUGAI))

The study results revealed that there was a significant decrease in symptom score, ESR and AEC in both Group A and Group B. However, the reduction in symptoms of Peenisa (Sinusitis) in Group B patients who were administered with both internal (Gowrisinthamani chendooram in a dose of 200 mg twice a day and Thirikaduku chooranam 2 tablets twice a day with adjuvant as honey for a period of 24 days) and external medicines (Internal medicines along with Peenisa pugai) was highly significant when compared with Group A **Table 1**.

Further radiological investigation (X-Ray PNS View) revealed that the combination of both external and internal therapy restored nearly 17 patients to have normal radiological features when compared with only internal therapy which restored 2 patients to have normal features **Fig. 2 and 3**.

The ingredients of Peenisa pugai which was used for external therapy consist of Thippili (*Piper longum*), Manjal (*Curcuma longum*), Omam (*Carum copticum*) and Milaku (*Piper nigrum*).



Several types of research have shown that both *Piper longum* and *Piper nigrum* has antimicrobial activity and contain effective compounds against antibiotic-resistant strains of bacteria. It has anti-inflammatory, antioxidant, antibacterial, antifungal, anti-allergic, antiasthmatic, immunomodulatory activities<sup>7-13</sup>.

The major components of the essential oil obtained from the aerial parts of *P. nigrum* were  $\alpha$ -pinene,  $\beta$ -caryophyllene and  $\alpha$ -terpinene. Piperine was the first amide to be isolated from Piper species, and it is the major active principle of black pepper terpenoids, alkaloids, flavonoids, and phenolic compounds were reported to be present in the organic extracts from *Piper nigrum*. Organic extract of *Piper longum* was reported to contain tannins, terpenoids and phenolic compounds which are responsible for its pharmacological properties<sup>14</sup>. The phytochemical curcumin from *Curcuma longa* has been known to possess anti-inflammatory activity in experimental animals<sup>15</sup>.

Another study showed that co-administration of curcumin with piperine, a compound found in pepper vine and peppers, increased the bioavailability of curcumin<sup>16</sup>. The bronchodilatory, anti-tussive, and anti-dyspnea effects were demonstrated for *C. copticum*<sup>17</sup>. It has also shown inhibitory effects on histamine receptors. Inhalation therapy of essential oils is being used to treat acute and chronic bronchitis and acute sinusitis and is reported to maintain the ventilation and drainage of the sinuses<sup>18</sup> and had an anti-inflammatory effect on the trachea<sup>19</sup> and reducing asthma<sup>20</sup>.

A previous study on the antimicrobial activity of herbal inhalation therapy indicates that the vapor activity of essential oils contributed considerably to the increased diameter of the inhibitory zone and has superior antimicrobial activity than by direct contact method<sup>21</sup>. These ingredients also contain essential oils that are a mixture of saturated and unsaturated hydrocarbons, alcohol, aldehydes, esters, ethers, ketones, oxides, phenols, and terpenes. These oils have well proven antibacterial, antibiotic, and antiviral anti-inflammatory properties. During inhalation, the vaporized essential oil penetrates to reach the subcutaneous tissues. Olfactory nerves from nose to the brain are the site of action for these essential oils, and the

mechanism of their action involves the integration of essential oils into a biological signal of the receptor cells in the nose when inhaled. Hence, it relieves nasal congestion, loosen secretions, maintain adequate hydration and promotes drainage of mucus and aids in pain relief.

**CONCLUSION:** The Prognosis of each patient was assessed by Friedman and katsantonis staging protocol. The results showed that the group B patients with both external and internal therapy showed good prognosis than group A.

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**CONFLICT OF INTEREST:** The authors declare that there is no conflict of Interest

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