



A REVIEW ON *CHITHIRAMoola KULIGAI* – THERAPEUTIC APPROACH FOR CERVICAL CANCER IN ACCORDANCE WITH SIDDHA PRINCIPLES

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Abstract:

Cervical cancer remains a significant global health challenge, claiming millions of lives annually despite advancements in medical science. This paper explores the multifaceted landscape of cervical cancer treatment, examining both conventional approaches and the potential benefits of integrating Siddha medicine, a traditional Indian system, into cancer care. While conventional treatments like surgery, chemotherapy, and radiotherapy are effective, they often come with significant side effects. Siddha medicine offers a holistic perspective, focusing on restoring balance and addressing individual constitution. One notable Siddha remedy, *Chithiramoola Kuligai* (CMK), stands out for its historical efficacy in treating various ailments, including cervical cancer. This herbo-metallic compound, composed of *Plumbago zeylanica*, *Tachyspermum ammi*, Mercurous chloride, and Palm jaggery, demonstrates potential anti-cancer properties while mitigating treatment side effects. The paper underscores the importance of patient-centered care by highlighting the meticulous selection of raw drugs in formulating CMK based on Siddha basic principles to treat cervical cancer, thus integrating diverse therapeutic modalities to meet the complex needs of patients while emphasizing the promise of Siddha medicine in enhancing treatment outcomes and improving overall well-being.

Keywords: Cervical cancer, Integrative care, Siddha, *Chithiramoola kuligai*, Patient-centered care.

Introduction:

Cancer stands as a prominent non-communicable disease (NCD) afflicting both developed and developing nations globally. In 2020, there were an estimated 19.3 million new cancer cases and about 10 million cancer deaths globally (1). Cervical cancer, a significant contributor to the global cancer burden, presents a formidable challenge to healthcare systems worldwide. A recent study highlighted that in 2020, nearly one million children lost their mothers to cancer, with nearly half of these losses attributed to breast or cervical cancer (2). Despite advancements in medical science, its prevalence continues to escalate, claiming millions of lives annually. This trend underscores the urgency for multifaceted approaches to treatment and management.

Urbanization, shifting lifestyle patterns, and environmental pollution serve as catalysts for the onset of cervical cancer, exacerbating its impact, particularly in regions experiencing rapid industrialization (3). Clinical manifestations of cervical cancer include evolving masses, abnormal hemorrhaging, weight fluctuations, painful micturition and pain in the pelvis or abdomen. The complexity of cervical cancer is further compounded by its ability to metastasize to distant sites within the body, posing significant challenges to treatment efficacy (4).

The 5-year relative survival rate for cervical cancer in India stands at around 46%, a figure notably lower compared to survival rates observed in other Asian nations such as China, South Korea, Singapore, and Thailand (5). Also in recent years, India has witnessed a surge in cervical cancer cases, highlighting the critical need for innovative treatment modalities. Timely identification of cervical cancer plays a pivotal role in facilitating effective management and treatment (6). While conventional therapies remain cornerstone approaches, there is growing recognition of the potential benefits of alternative medicines in the oncological landscape.

Alternative medicines offer a holistic approach to cancer care, addressing not only physical symptoms but also emotional and spiritual dimensions of healing. Moreover, these modalities have shown promise in mitigating the side effects of conventional treatments, thereby enhancing the overall quality of life for patients. Embracing alternative medicines as part of a comprehensive cancer care strategy can empower patients and improve their well-being throughout their treatment journey (7). Within the realm of alternative medicines, the Siddha system, a traditional practice prevalent in South India, offers a rich array of therapeutic options for cervical cancer management. One notable remedy within this system is *Chithiramoola Kuligai* (CMK), (8-10) a herbo-metallic drug with a history of efficacy in treating various ailments, including cervical cancer. The inclusion of such traditional remedies underscores the importance of exploring diverse therapeutic modalities to meet the complex needs of cervical cancer patients. As India grapples with the rising burden of cervical cancer, leveraging indigenous knowledge systems like Siddha medicine holds promise in enhancing treatment outcomes and improving the overall well-being of individuals affected by this formidable disease.

Treatment approaches in Modern Medicine:

Cancer treatment modalities, ranging from conventional to advanced methods, are chosen based on factors like cancer type, location, and stage (11). The most widely used conventional treatment methods are surgery, chemotherapy, and radiotherapy, while advanced modalities include hormone therapy, anti-angiogenic, stem cell therapies, immunotherapy, and dendritic cell-based immunotherapy (12).

Treatment for invasive cervical cancer varies based on disease stage. Microinvasive carcinoma responds well to non-radical treatment. Stage Ia1 and Ia2 will be managed by simple or radical hysterectomy, conization, trachelectomy with or without lymph node dissection. If needed, internal radiation can also be an option. Stage Ib1 often involves radical hysterectomy, while laparoscopically assisted radical vaginal hysterectomy is also an option. Radical vaginal trachelectomy may preserve fertility in small cancers. For stages Ib–IIa, both radical surgery and radiotherapy are effective, with differing complications. Neoadjuvant chemotherapy before surgery may benefit Ib2 patients. Management for bulky stages IIb–IIIb varies; some prefer primary surgery followed by tailored

radiation or chemotherapy, while others opt for chemo-radiation therapy. Neoadjuvant chemotherapy followed by surgery or radiation may benefit these patients. Concurrent chemoradiation enhances outcomes in advanced disease. Postoperative radiation, with or without concurrent cisplatin-based chemo, is beneficial for high-risk features found during hysterectomy. Topotecan and cisplatin combination therapy improves survival in stage IVB and recurrent disease. Ongoing trials are investigating enhanced chemo for both early and advanced stages, with non-platinum regimens possibly needed for high-risk patients receiving cisplatin-based chemoradiation (13-16). For recurrent cervical cancer, treatment varies: chemo-radiation for pelvic failure, pelvic exenteration for central pelvic relapse after radiation, and cisplatin-based chemo-radiation for para-aortic lymph node recurrence. Chemotherapy is palliative for distant or loco-regional failures. Combination chemotherapy improves response rates, but median survival is typically under a year, with rare long-term remissions reported (17).

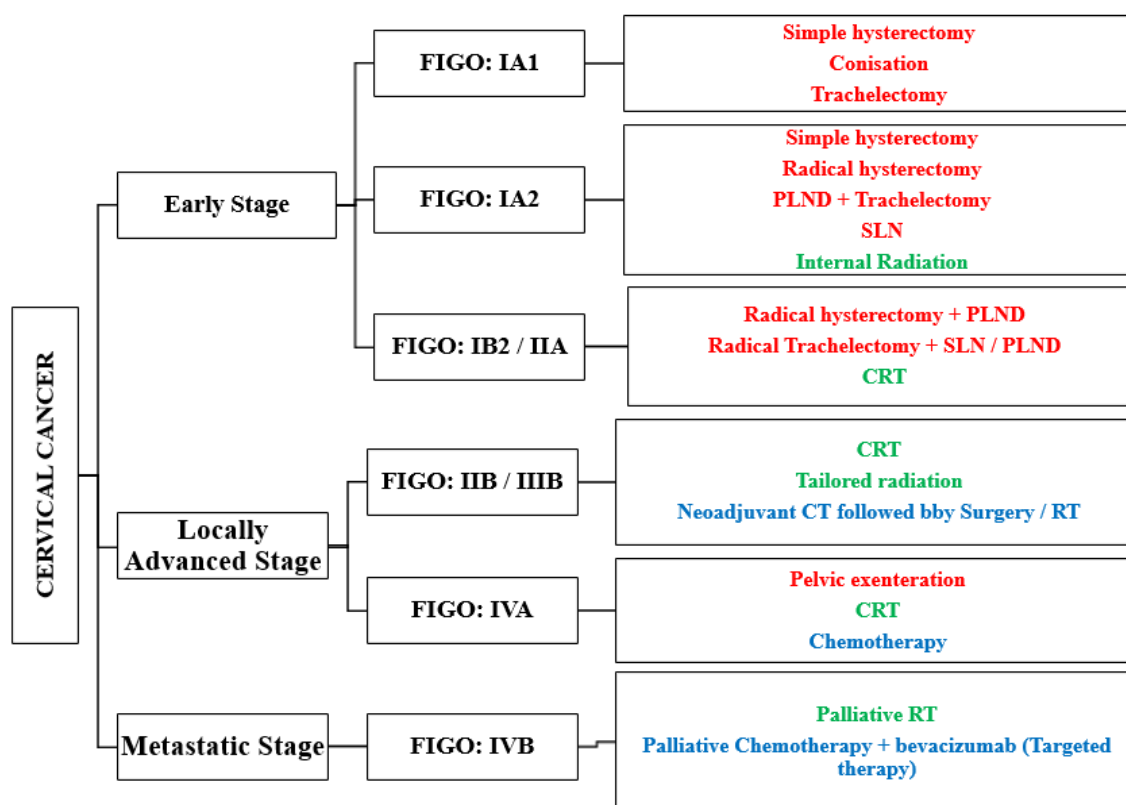


Fig:1. Overview of Treatment options for cervical cancer based on its staging

Surgical procedures are mentioned in red, radiation in green and chemotherapy in blue. PLND- pelvic lymph node dissection; SLN – sentinel lymph node biopsy; CRT – chemoradiotherapy; RT – radiotherapy. Adapted from Burmeister et. al. and Marth et. al.

Treatment approaches in Siddha Medicine:

In situations where conventional biomedical treatments are ineffective or unavailable, the Siddha approach emphasizes enhancing digestion, detoxification, reducing tumor growth, and enhancing tissue metabolism as beneficial. Siddha medicine is not typically used as the primary treatment for cancer; however, in cases where biomedical options are limited, a specific Siddha approach may be employed. This approach mirrors biomedical oncology concepts of tumor cytoreduction. Siddha supportive care for cancer focuses on restoring balance, enhancing mental and physical resilience, and promoting rejuvenation. Recognizing the adverse effects of conventional cancer treatments, Siddha medicine proposes traditional methods to restore balance in the body. Therapeutic interventions include dietary adjustments, lifestyle modifications, physical activities such as yoga,

and mind-body practices like pranayama (yoga breathing exercises), along with the use of herbal, metals and mineral drugs. Treatment protocols are typically multimodal, tailored to individual Siddha diagnoses, with a general focus on detoxification and tumor size reduction through the activation of *Agni* (digestive fire) and balancing *kabavatham* (a concept related to tumor reduction) (18).

"All diseases originate from the gut." Lifestyle changes weaken *agni*, resulting in incomplete digestion and the formation of *amam*, a toxic residue in the body. *Amam*, described as "uncooked food" or incomplete nutrient transformation, includes metabolic toxins and environmental impurities. When *amam* accumulates in tissues due to blockages in nutrient flow, it becomes a seed for diseases. This buildup triggers inflammation as the immune system reacts to the foreign material. Incomplete digestion is thus linked to early stages of disease and chronic inflammation, potentially influencing cancer progression (19,20).

In Siddha medicine, the principles of *Vatham* (principle of movement), *Pitham* (principle of transformation), and *Kabam* (principle of structure) doshas form the cornerstone of holistic health management. *Vatham* governs movement and communication, *Pitham* regulates metabolism and digestion, and *Kapham* provides structural integrity and immunity. Each individual has a unique *thegi* (body constitution), with doshas predominant as a single dosha (V, P, or K) or combinations (VP, PK, KV, VPK). *Thegi* influences responses to the environment, including susceptibility to diseases and drug reaction (21). Balanced doshas result in unique positive traits, while imbalances lead to specific vulnerabilities. So, maintain balance among these doshas is crucial for holistic health and well-being (22). In cancer, changes in *kapham* result in weakened immunity and compromised tumor integrity, while *vatham* contributes to tumor growth and its ability to spread. Additionally, the presence of *aamam* exacerbates these altered humors, significantly influencing cancer initiation. Therefore, when selecting internal medications, it is crucial to target these two humors and to eliminate *aamam*, while restoring the balance between all these factors.

In addition to internal medications, various less invasive external methods are employed in treating cancers including cervical cancer. These include *Suttigai* (cauterization), *Attai vidal* (leech therapy), and *Kaaram* (alkaline medicines), among others. *Suttigai*, a para-surgical procedure in Siddha medicine, involves targeted destruction of cancerous tissue using heat. Siddhar *Nagamuni* has advocated its use, particularly when followed by the application of purified powder of *thurusu* (copper sulphate). Commonly used metal based tools like *Aazhisuttigai* and *Pottusuttigai* aid in managing cancer by removing excessive growth or controlling bleeding. Studies, such as Cashman BZ's research on cervical cancer and Peyton FW's studies on maintaining healthy cervix through cauterization technique, have demonstrated the efficacy of *Suttigai* in cervical cancer (23, 24). Moreover, modern medicine utilizes similar techniques like electrocautery, cryosurgery, chemical cauterization, radiofrequency ablation (RFA), and microwave ablation in cancer treatment. These approaches collectively contribute to the comprehensive management of cancer, targeting tumors while minimizing harm to surrounding healthy tissues (25-29).

Leech therapy is another method of less invasive external method in practiced in cancer treatment to alleviate the pain. The leech (*Hirudo medicinalis*) is commonly used in traditional medicine for relief of localized pain, and leech therapy has been used for treatment of pain for many centuries (30). It has been suggested that the analgesic effect of leeches may be due to salivary secretion of analgesic agents, such as inhibitors of kallikrein, and anti-inflammatory agents, including protease inhibitors (31). Met-enkephalin and Leu-enkephalin are small endogenous peptides and bind to the same specific receptors as opiate analgesics (32).

***Chithiramoola Kuligai* – an elixir for cancer treatment:**

Chithiramoola kuligai (CMK), is a herbo-metallic compound formed into small pepper sized pills. It is prepared by grinding powdered, purified root bark of *Chithiramoolam* (*Plumbago zeylanica*), purified *Omam* (*Tachyspermum ammi*), purified *Pooram* (Mercurous chloride), and Palm Jaggery for 6 hours. These pills are ingested with water, two pills taken twice daily. CMK has traditionally been utilized for various conditions such as *Viranam*, *Rana Kiranthi*, *Yoni puttru*, *Soolai*, *Kallipu kiranthi*,

Linga puttru, Powthiram, kanna pilavai, Pakka pilavai, Maar silanthi, Vippurathi, 8 Vagai gunmam, and Maega Ranam (8-10).

Chithiramoolam (Plumbago zeylanica):

Chithiramoolam has a pungent taste, accompanied by a tingling sensation and heat, which mirrors its potent energy and its conversion into a pungent form within the body (33). The text "*Katti viranankranthi kaalkal araiappu*" outlines the typical characteristics of the root of *Plumbago zeylanica*, highlighting its potential efficacy in treating various conditions such as bleeding wounds, glandular swelling, scrotal swelling, inguinal lymphadenopathy, pricking pain, swelling, *vatha* diseases, skin diseases, acid peptic disorders, delirium, seizures, perianal abscess, dropsy, ascites, hemorrhoids, and contusions (34, 35)

Omam (Tachyspermum ammi):

The taste of *Omam* is characterized by its strong pungency and heat, which reflects its potent energy and its transformation into a pungent form within the body (33). The phrase "*Seethasuram kaasam seriyaamantham porumal*" describes the common traits of *Tachyspermum ammi* fruits, emphasizing their potential effectiveness in alleviating periodic fever, cough, indigestion, stomach rumbling, diarrhea, inflammatory bowel conditions, tenesmus, dysentery, respiratory disorders, dental and gum problems, and genital ailments (34).

Panai vellam (Palm jaggery):

Palm jaggery offers a sweet taste, imparting a cooling sensation, and is metabolized into sweetness (33). The phrase "*Thangupanai vellathaal vaathapitham veerukabam sanni noi*" highlights the shared characteristics of *Borassus flabellifer* jaggery, underlining its potential in managing conditions related to imbalances in *vatham*, *pitham*, *kabam*, delirium, ageusia, and acid peptic disorders (33).

Pooram (Mercurous chloride):

Pooram, also known as *Rasakarpooram*, provides a salty and bitter taste, eliciting a sensation of heat and metabolizing into pungency (36). Described in the phrase "*Idai vaathasoolai erisoolai gunmam*," *Pooram* is known for its unique characteristics. It is believed to effectively treat conditions such as pain disorders associated with imbalances in *pitham*, stomach disorders, itching, and *vatha* diseases when consumed with jaggery for seven days. (34).

Discussion:

An integrative approach to managing illnesses like cancer entails combining conventional medical practices with evidence-supported complementary therapies, nutritional interventions, and lifestyle modifications. This comprehensive strategy aims not only to treat and prevent diseases but also to foster overall health and well-being (37). Alternative medicines provide a holistic perspective on cancer care, addressing physical symptoms as well as emotional and spiritual aspects of healing. Furthermore, these therapies have demonstrated potential in alleviating the adverse effects associated with conventional treatments, ultimately improving patients' overall quality of life. Integrating Siddha medicine into cancer care presents numerous benefits, as this system emphasizes customized medications tailored to individual patients based on fundamental principles such as *thiridoshams* (three humors), *thegi* (body constitution), *naadi* (pulse examination), and *en vagai thaervu* (eight-fold examination). Medications are selected according to criteria like taste, potency, and bio transformed form. This comprehensive perspective aligns with the growing recognition in modern medicine of the importance of patient-centered care and the mind-body connection in healing.

Chithiramoola Kuligai (CMK) has been a cornerstone cancer treatment within the Siddha system of medicine for centuries. This formulation, composed of four key ingredients - the root bark of *Plumbago zeylanica*, fruits of *Tachyspermum ammi*, Mercurous chloride, and Palm jaggery - has stood the test of time in clinical practice (8-10). Extensive literature review indicates that the properties of

each individual raw drug are either aligned with symptoms associated with cervical cancer or aimed at mitigating the underlying imbalances of *thiridoshas* that can lead to cervical cancer. The general characteristics of *Plumbago zeylanica*, such as its association with bleeding wounds, inguinal lymphadenopathy, pricking pain, swelling, and skin diseases, are consistent with symptoms commonly observed in cervical cancer (38). Likewise, *Tachyspermum ammi*'s properties, which include addressing genital ailments, provide strong evidence of its potential action in cervical cancer treatment. Furthermore, its ability to alleviate symptoms like periodic fever, indigestion, stomach rumbling, diarrhea, inflammatory bowel conditions, tenesmus, and dysentery suggests a potential role in managing the side effects of conventional cancer treatments (39-41). Similarly, Pooram is also believed to possess the potential to alleviate stomach disorders and itching, which may be associated with cancer symptoms or adverse effects of chemotherapy or radiation treatment.

Additionally, both *Plumbago zeylanica* and *Pooram* are traditionally used in Siddha medicine to alleviate *vatha* diseases. Palm jaggery is reported to be utilized in conditions arising from imbalances in all three humors as per Siddha literatures. According to Siddha principles, treating cancer involves choosing drugs that balance *kabam* and *vatham* while eliminating *aamam*. When considering the ideal medication for cervical cancer, it is essential that the drug possesses heat potency (*veppa veeriyam*) to effectively target cancer cells. All components of CMK, with the exception of palm jaggery, have a pungent taste, indicating heat potency. Furthermore, they undergo biotransformation into a pungent taste, reinforcing their heat-potent characteristics. To maintain a balanced formulation and mitigate potential adverse effects stemming from the heat potency of the other ingredients, palm jaggery, known for its cooling properties, is incorporated. Notably, despite its cooling nature, palm jaggery possesses the unique ability to address all three doshas, thereby aiding in the balancing of *kabam* and *vatham*. Thus, the ingredients in *Chithiramoola Kuligai* (CMK) may exhibit potent anti-cancer activity against cervical cancer based on these principles.

Conclusion:

In summary, integrating Siddha medicine into cancer care offers a holistic and personalized approach, aligning with modern principles of patient-centered care. *Chithiramoola Kuligai* (CMK), with its carefully selected ingredients like *Plumbago zeylanica* and *Tachyspermum ammi*, addresses cervical cancer symptoms while mitigating treatment side effects. Palm jaggery's inclusion balances CMK's formulation, highlighting the potential of traditional medicine in enhancing cancer treatment outcomes.

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