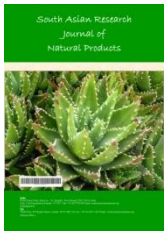

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Literature Study on Opium Containing Drug Preparations Mentioned in "Vatika Prakaranaya"

R. M. D. Sasrika[1*] and W. M. S. S. K. Kulatunga[1]

[1]Institute of Indigenous Medicine, University of Colombo, Rajagiriya, Sri Lanka.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Background: *Vatika prakaranaya* is one of the most important indigenous medical pharmacopoeia named "*Vatika prakaranaya hewath Beheth guli kalka potha*". It was written by Dr. Illeperuma Arachchige Don Sadiris De Alwis Illeperuma in 1879 which contained different kinds of traditional drug preparations. It included various traditional formulae with its indications including opium containing drug preparations. Opium is considered as narcotic drug which acts on central nervous system. The most common active ingredients of opium are morphine, codeine and thibeine. In traditional drug preparation methods opium is taken after special purification.

Aims and Objectives

General Objective: To find out opium containing drug preparations mentioned in *"Vatika Prakaranaya".*

Specific Objectives: To find out the indications mentioned in opium containing drug formulae.
To analyze the amount of opium in drug formulations.

Methods: The literary review was done by the principle investigator from *Vatika Prakaranaya;* from May to August 2017 in the library, Institute of Indigenous Medicine, University of Colombo, Sri Lanka. The observations were recorded accordingly and the data were analyzed by SPSS and presented in percentage.

Results: 120 opium contained formulae were identified. Out of these 120 preparations 70.83% were pills *(Guli)* and 4% were pastes *(Kalka)* and 30 formulae were found as fluid vehicles in

**Corresponding author: Email: dilshanisasrikajayasekara@gmail.com;*

medicine *(Anupana)*. Majority of them were prescribed for diseases in GIT (92.2%) and CNS (87.8%) disorders. When considering the amount of opium in these formulae majority of them (61%) had less than 5% of opium.

Conclusion: Most of the opium contained drug preparations mentioned in *Vatika prakaranaya* were used for GIT and CNS disorders and the amount of opium present in these formulae were less than 5%.

Keywords: Vatika Prakaranaya; opium; traditional medicine; Ahiphena.

1. INTRODUCTION

Most of the countries have their own medical system which is nourished by traditional knowledge. Sri Lankan society also had very rich indigenous medical knowledge [1]. *Vatika Prakaranaya* is one of the best evidence for it. This traditional pharmacopoeia named "*Vatika Prakaranaya hewath Beheth guli kalka potha*" was written by Vaidyaachaarya Illeperuma Arachchige Don Sadiris De Alwis in the year of 1879 [2]. Up to now it was edited in four times. Sri Lankan traditional medical practices give priority to *Kaya Chikithsa* than *Shalya Chikithsa*. Most of skilled traditional medical practitioners used drug formulae mentioned in *Vatika Prakaranaya* to cure critical patients.

Opium is a highly addictive narcotic drug [3]. Opium (poppy tears, *Lachryma papaveris*) is the dried latex obtained from the poppy plant (*Papaver somniferum).* In Sanskrit opium is known as "*Ahiphena"* is snake venom [4]. In recorded history that opium was known by Chinese before the 9th DC [5].

Opium contain two types of alkaloids, depending on chemical structure and action. Morphine, codeine, and thebaine, which upon the central nervous system and are analgesic, narcotic, and potentially addicting compounds [6]. Papaverine, noscapine (narcotine), and most of the other opium alkaloids act only to relax involuntary (smooth) muscles.

In medical practice opium alkaloids use as analgesic, tranquillizer, antitussive and antidiarrheal. In *Bhava Prakasha* mentioned about opium as *Khaakhasa Phala* and said it has water absorbent (*Graahi*) property, bitter and astringent in taste, increases *Vata dosha* and reduces *Kapha dosha [*7]. *Raaja Nigantu* also quoted that, *Aaphuukam* (opium) dries up all the secretions, water absorbent, relieves *Kapha dhatu.* Sharanghadhara Samhita also mentioned opium as a pain relief [8].

2. METHODOLOGY

The literary review was done by studying "*Vatika Prakaranaya"* in the Library, Institute of Indigenous Medicine, University of Colombo, Sri Lanka from May to August 2017. The 4th edition of *Vatika Prakaranaya* was selected for this study. Total book was read by the principle investigator carefully and collected opium contained drug formulae. The search resulted formulae were analyzed according to their types of preparation method, indication in system-wise and the amount of opium in each preparation. The observations were recorded accordingly. Data were analyzed by using SPSS and finally; calculated data were presented in percentages.

3. RESULTS AND DISCUSSION

The study found that the 4th edition of *Vatika Prakaranaya* contains, 5293 poetry included 319 of formulae of pills *(Guli)*, 24 formulae of pastes *(Kalka)* and 30 fluid vehicle of medicines *(Anupana)*. Out of these 373 of drug formulae 120 opium contained drug formulae were found (32.2%).

4. DISCUSSION

In this study revealed that majority of opium contained formulae used for the disorders of gastrointestinal tract,central nervous system and respiratory system. In the GI system the most common indications were found vomiting, anorexia and diarrhea.

According to the following researches describe the relationship between opioid and GI system. As a result of opioid peptide action there occurs increasing the sphincter tone, inhibition of gastric emptying, induction of stationary motor patterns and blockage of peristalsis ensue, and together with inhibition of ion and fluid secretion, these effects cause constipation [9].

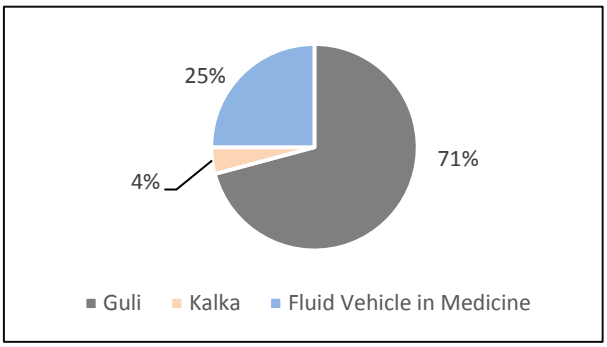

Fig. 1. Distribution of the types of preparation of drug formulae

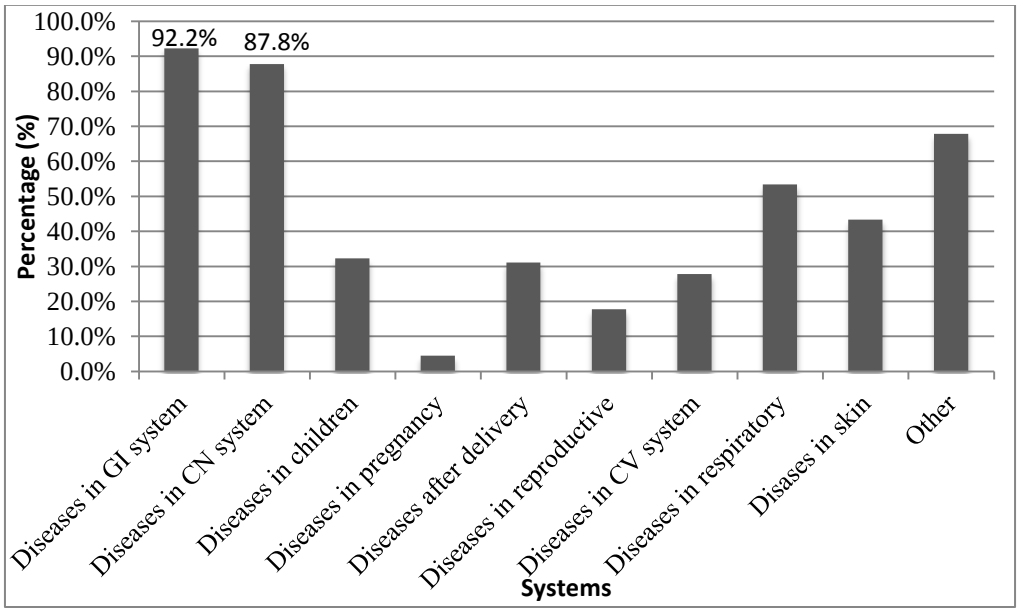

Fig. 2. Distribution of opium containing drug formulae according to its indications

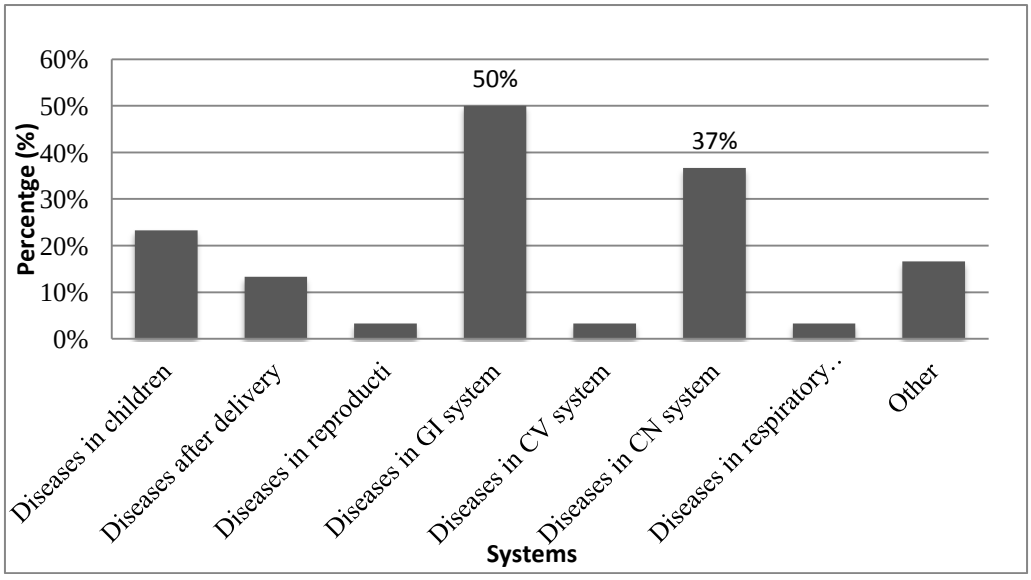

Fig. 3. Distribution of opium containing fluid vehicles in its indication

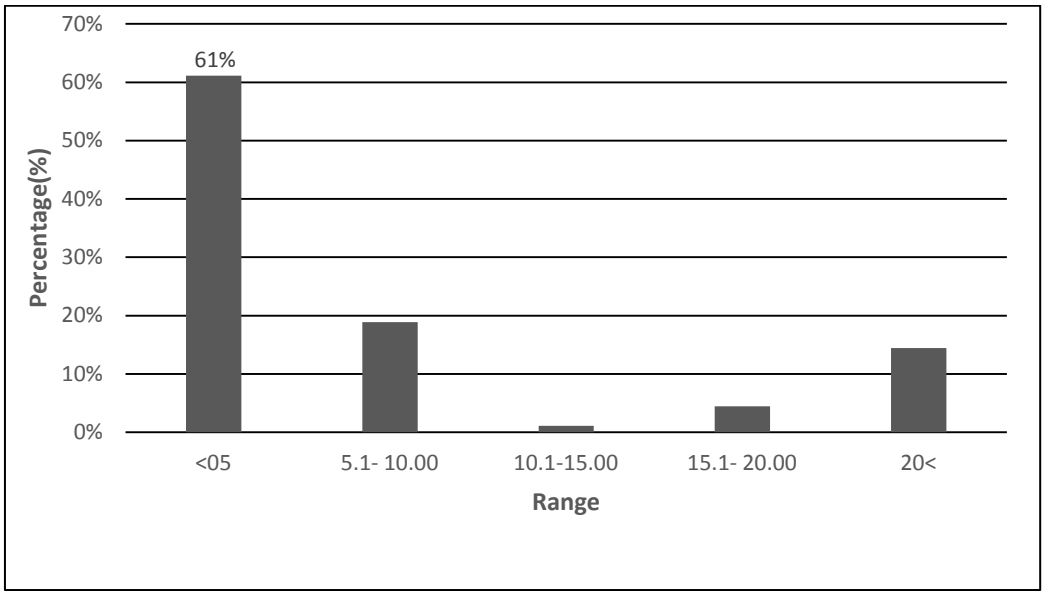

Fig. 4. Distribution of the amount of opium in the formulae

Another research found that opioid peptides have a major physiological role in the control of gut motility and secretions and these actions explain most of the pharmacological effects of opiate substances on digestive tract [10].

Opioids involved the enteric nervous system and control of motility, control of acid secretion and control of electrolyte secretion in GIT [11]. By stimulation of GI opioid receptors can be exploited to stop diarrhoea, because constipation is one of the most frequent and troublesome adverse effects of opioid analgesics [12].

The morphine which is the prototype of opiate acts to delay gastric emptying and intestinal transit, to suppress intestinal secretion of water and electrolytes and to suppress the transport of bile in to the duodenum [13].

One research found that, the opioids, in the gatrointestinal tract plays an important physiological role, but is also responsible for the side effect of opioid drugs, including troublesome constipation in chronic pain treatment. Differences in the activity of the opioids are responsible for the vulnerability to changes in GI motility during treatment with opioids [14].

Opioid medications are commonly used in clinical practice and have acute or chronic effects on diverse regions of the gastrointestinal tract. In the stomach, a marked delay in gastric emptying may ensue with postprandial nausea and early satiety. In the colon, opioid induced constipation is common [15].

The GI tract is one of the major targets of the undesired effects of opiates, because the ENS expresses all major sub types of opioid receptors which when activated dampen GI function [16].

Most of the opium contain prescriptions mentioned in *Vatika Prakaranaya* used for diarrheoal disorders according to the results.

Fig. 2 showed that the second most opium contain drug prescriptions used for central nervous system disorders. The Prominent indications in CNS are *Sanni Roga* (convulsions) and *Ruja* (pain in all over the body). Opium is one of the oldest herbal medicines currently used as an analgesic, sedative and anti-diarrhoeal treatments. Also it quoted that opium have analgesic effects on the central or peripheral nervous systems. These analgesic effects are due to decreased perception and reaction to pain, and increased pain tolerance. Hence opioid medications are widely used in the management of acute and chronic pain [17].

According to another research, The opioid systems play an important role in mediating both physical pain and negative affects [18].

In agreement with a research, opioids are one of the most prescribed drug classes for treating acute pain. However, chronic use is often associated with tolerance as well as debilitating side effects, including nausea and dependence, which are mediated by the central nervous system, as well as constipation emerging

from effects on the enteric nervous system [19].

As reported by an article, opium is effective in spinal and supraspinal analgesia, respiratory depression, sedation, nausea, vomiting, euphoria [20].

One research mentioned opioid drugs; typified by morphine; produce their pharmacological actions, including analgesia by acting on receptors located on neuronal cell membranes [21].

Besides GIT and CNS, opium conained drug formulae is effective in respiratory disorders (figure 2). A research proved that opioids can be effective at reducing troublesome respiratory symptoms in individuals with advanced COPD [22].

As it is mentioned in one article, opioids are being implemented variably in practice for chronic breathlessness [23].

As reffering to research, low-dose opioids can relieve breathlessness but may be underused in late-stage COPD due to fear of complications, contributing to poor symptom control [24].

Another research quoted, morphine is used as palliative treatment of chronic breathlessness in patients with advanced chronic obstructive pulmonary disease (COPD) [25].

As stated, dyspnea is the most frequently reported symptom of outpatients with advanced chronic obstructive pulmonary disease (COPD). Opioids are an effective treatment for dyspnea. Nevertheless, the prescription of opioids to patients with advanced COPD seems limited [26].

It is mentioned in another research, opioid receptors are widely distributed in the human body and are crucially involved in numerous physiological processes. These include pain signaling in the central and the peripheral nervous system, reproduction, growth, respiration, and immunological response. Opioid receptors additionally play a major role in the gastrointestinal (GI) tract in physiological and pathophysiological conditions [27].

As explained in one research The effects of opiates are many, including a rush immediately after injection, extreme relaxation, decreased sensation of pain, and decreased sexual drive. Other effects include nausea and vomiting along with slowed breathing. The brain is stimulated and thus causes nausea and vomiting usually occurs to detoxify the system. Moreover, opiates also increase muscle tension in the gastrointestinal tract [28].

It was observed that, majority of fluid medicine of vehicles are used to the GIT an CNS disorders.

Majority of formulae contained below 05% of opium. Similar results were observed in other studies also [29]. When using opioids, the goal of therapy should be to use the lowest effective dose with minimal side effects.

6. CONCLUSION

Majority of opium content drug formulae mentioned in traditional pharmacopeia *Vatika Prakaranaya* used for GIT, CNS and respiratory diseases and most of the formulae had very low amount of opium less than 5%.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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