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SURVEY ON THE USAGE OF EKAWERIYA (SARPAGANDA) TABLETS AND A COMPARISON OF ITS TOTAL ALKALOID CONTENT IN VARIOUS BRANDS

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ABSTRACT

Ekaweriya/Sarpagandha tablet is an ayurvedic medicine which is being used extensively as an anti-hypertensive drug in ayurveda medicinal system.

The root of Ekaweriya plant (*Rauvolfia serpentina*) is made into a powder & prepared as a tablet. There are several brands of Ekaweriya tablet in the market. The main active ingredient of this tablet is an alkaloid called reserpine. It is important that the alkaloid content of each tablet should be equal since the effectiveness of the tablet depends on the alkaloid content. Accordingly, it is necessary to determine the alkaloid content of the Ekaweriya tablets.

In this project, we studied the usage of Ekaweriya tablets in Piliyandala Medical Officer of Health division. The survey revealed that Ekaweriya tablets are used commonly and it is the main ayurvedic drug used as the first line treatment for hypertension in Piliyandala MOH division.

From the chemical analysis it was revealed that the alkaloid content of Ekaweriya tablets differ brand to brand. Percentages of total alkaloid content of 5 market samples are as follows. Brand A – 20 %, brand B – 04 %, brand C – 09 %, brand D – 06 %, brand E – 11 %. In addition, the organoleptic evaluation of the tablet revealed that most of brands were producing tablets which were not up to standard.

Considering all the above facts it can be concluded that Ekaweriya tablet is a very effective drug to manage hypertension, but most brands in the market are not up to standards. Therefore attention should be drawn to find suitable parameters to standardize these tablets in order to bring about the maximum efficacy of the tablets.

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Table of Contents

List of Tables

List of figures

List of Abbreviations

MOH	Medical Officer of Health
ACE	Angiotensin Converting Enzyme
HCTZ	Hydrochlorothiazide

CHAPTER 1

INTRODUCTION

1.1. Ekaweriya tablets (Sarpagandha vati)

Hypertension is a disease having life-threatening effects with regards to vital organ involvement if left untreated. Hence, wide ranges of anti-hypertensive drugs are available but the problem of side effects is also equally large after long term or illogical administration of these drugs. Ancient ayurvedic texts have mentioned many types of medicaments for the control and treatment of hypertension. Among these medicines the most widely used drug today is Ekaweriya tablet also known as Sarpagandha Vati. (Fig.1.1)

It is called Ekaweriya tablets because it is prepared by using mainly the root of *Rauwolfia serpentina* plant. Unlike other ayurvedic medicines, Ekaweriya tablets are easy to administer so that the patient compliance is high. The powdered root is compressed into a tablet form mainly for the convenience of the patient. In some hospitals where there are no such machines, the powder is given to the patient to administer with water.

The Sri Lankan Ayurvedic Pharmacopoeia volume I part 2 has mentioned that for hypertension, only the powdered root of *Rauwolfia serpentina* plant is used for the preparation of Ekaweriya tablet. However, volume I part 1 of Ayurvedic Pharmacopoeia states that the Ekaweriya tablet is made by using powdered root of *Rauwolfia serpentina* plus powdered fruit covering of *Terminalia chebula*. (Aralu in sinhala)

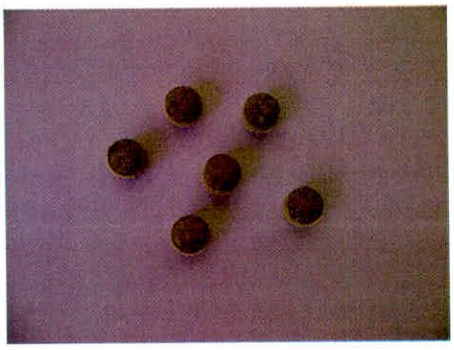

Figure 1.1 – Ekaweriya tablets

1.2 Alkaloids[1]

Alkaloids are found primarily in plants and are especially common in certain families of flowering plants. More than 3000 different types of alkaloids have been identified. The function of alkaloids in plants is not completely understood. It is stated that they are waste products of plant's metabolic processes but evidence suggested that they might serve specific biological functions. In some plants, the concentration of alkaloids increases just prior to seed formation and then drops off when the seed is ripe, suggesting that alkaloids may play a role in this process. Alkaloids may also protect some plants from destruction by certain insect species and in some, alkaloids helps the plant to heal wounds.

The chemical structures of alkaloids are extremely variable. Generally, it contains at least one nitrogen atom in a cyclic hydrocarbon. The name alkaloid ("alkali-like") was originally applied to the substances because they behave like the inorganic alkalis and they react with acids to form salts. Most alkaloids are colourless, nonvolatile, crystalline solids. They also tend to have a bitter taste.

Alkaloids are often classified based on their chemical structure. For example, alkaloids that contain a ring system called 'Indole' are known as 'Indole alkaloids'. Accordingly, some classes of alkaloids are Pyrrolidines, Pyridines, Tropanes, Pyrrolizidines, Isoquinolines, Indoles, Quinolines. Alkaloids can also be classified according to the biological system in which they occur. For example, the opium alkaloids occur in the opium poppy. This dual classification system actually produces little confusion because there is a tough correlation between the chemical types of alkaloids and their biological distribution.

The medicinal properties of alkaloids are quite diverse. Morphine is a powerful narcotic used for the relief of pain, though its' addictive properties limit its usefulness. Codeine, the methyl ether derivative of morphine found in the opium poppy, is an excellent analgesic that is relatively non-addictive. Certain alkaloids act as cardiac or respiratory stimulants. Quinidine, which is obtained from plants of the genus *Cinchona,* is used to treat arrhythmias, or irregular rhythms of the heartbeat. Many alkaloids affect respiration, but in a complicated manner such that severe respiratory depression may follow stimulation. The drug lobeline from *Lobelia inflata* is safer in this respect and is therefore clinically useful. Ergonovine and ephedrine act as blood vessel constrictors. Ergonovine is used to reduce uterine haemorrhage after childbirth, and ephedrine is used to relieve the discomfort of common colds, sinusitis, hay fever, and bronchial asthma. Many alkaloids possess local anaesthetic properties, such as cocaine. Quinine is a powerful anti-malarial agent that was formerly the drug of choice for treating that disease.