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ORIGINAL RESEARCH ARTICLE

Arogyavardhini Vati – Critical Analysis of a Miracle Drug

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ABSTRACT

Introduction: *Arogyavardhini Vati* is a herbomineral preparation which has miraculous effects on many diseases. It has the ability of balancing *Tridosha* and is beneficial in many liver disorders, dyslipidemia, metabolic syndrome, skin diseases, etc. Many clinical research and animal studies have been done to establish its actions in various diseases and its safety during use.

Material and Methods: Here, in this article, an attempt is made to collect all the literary data about *Arogyavardhini Vati* from our treaties and all the research articles available. These data are compiled and analyzed and the results obtained are presented.

Results: The *Rasapanchaka* analysis shows that *Arogyavardhini Vati* is *Tikta Rasa Pradhana* (27.59%) followed by *Kashaya* (24.14%) and *Katu* (20.69%) *rasa*, predominant in *Laghu* (29.03%) and *Ruksha Guna* (29.03%), *Ushna Virya* predominant (54.55%), and the *Vipaka* was *katu* (54.55%).

Discussion: Research evidence shows that *Arogyavardhini Vati* is effective on various liver diseases such as hepatitis, non-alcoholic and alcoholic fatty liver, *Jalodara* or ascites due to liver disorder, and autoimmune liver disease. Animal experiments also proved its hepatoprotective activities. It has anti-hyperlipidemic action, helps in metabolic syndrome, and is beneficial in many skin diseases. It reduces the pus discharge in *karna srava* or chronic suppurative otitis media. Studies show that pharmaceutical and analytical parameters for *Arogyavardhini Vati* are validated by HPTLC method. Toxicity studies show no accumulation or toxic effect of mercury and copper on vital organs.

Conclusion: *Arogyavardhini vati* is safe and miraculously effective in many diseases.

1. INTRODUCTION

Arogyavardhini Vati is considered a miracle drug in Ayurveda due to its extremely efficacious effects in different diseases. It is an Ayurvedic formulation classified under *Rasa Yoga*, in which minerals are the main ingredients. This formulation has been created by Shri Nagarjuna Yogi Raja.[1] Its oldest authentic reference is *Rasaratnasamuchchaya, Visarpadichikitsa, Adhyaya* 20 written by Vagbhatta in the 11th century. While the drug has been mentioned in *Rasaratnasamucchaya* in the context of *Kustha* (skin disorder),[2] in *Bhaishyajyaratnavali,* it is mentioned in the context of *Yakritvikara* (liver disorder).[3] The term *Arogyavardhini* indicates "which can destroy all the diseases and promotes health." *Rasaratnasamucchaya* mentioned *Arogyavardhini Vati* as *Sarvarogaprashamani* (can specify all types of disorders). The word "*Arogya*" means good health and "*Vardhini*" means to improver. It means a formulation, which improves good health, thus known as "*Arogyavardhini*."

This is a herbomineral formulation containing processed mercury, sulfur, copper, iron, mica, pericarps of *Terminalia chebula*, *Terminalia bellirica*, *Emblica officinalis*, stolon, and root of *Picrorhiza kurroa*, the resin of Commiphora mukul, leaves of *Azadirachta indica*, shilajit and roots of *Ricinus communis* as ingredients. It is used extensively in Ayurveda as a drug for treating liver disorders, jaundice, chronic fever, edema, disorders of adipose tissue, obesity, and diseases of the skin which is also supported by various scientific researches. *Arogyavardhini Vati* cures all *Kushtha Roga*. It is a great *Rasayan, Pachani,* and *Dipani*

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and hence is good for lack of appetite, indigestion, and irregular bowls. It acts as an alternative, carminative stomachic, and relieves various types of fever. In case of fever, the pill should be given on the 6th day. This is used in the imbalances of all three *Dosha* (humor).

1.2. Preparation of *Arogyavardhini Vati*[4]

Arogyavardhini Vati can be prepared by the following method. All the given ingredients are collected and weighed in the required quantity as per their ratio in the formulation. Table 1 shows ingredients of *arogyavardhini vati.*

The following steps can be followed for preparation of the *Arogyavardhini Vati:*

1. Step 1: The dried plant parts, namely *T. chebula* (pericarp), *T. bellirica* (pericarp), *E. officinalis* (pericarp), *R. communis* (root), and *P. kurroa* (stolon and root), are subjected to grinding and passed through a sieve no. 44. *A. indica* leaves are separately collected and passed through sieve no. 16 to obtain a coarse powder
2. Step 2: Purified mercury is prepared by triturating an equal quantity of raw mercury and lime powder together for 3 days, then an equal part of garlic (*Allium sativum*) and rock salt are added and again triturated till the paste of garlic turns black. Purified sulfur is prepared by mixing small pieces of raw sulfur in an iron pan with an equal quantity of cow ghee, further heated till the melting of sulfur, and then poured into a pot containing cow milk (q.s.). Sulfur is collected after cooling by decanting the milk and subjected to washing with hot water. The process is repeated 7 times. At the end of the process, sulfur is washed and dried. Finally, *Kajjali* is prepared by triturating an equal quantity of purified mercury and purified sulfur in *Khalwa* for sufficient time till it becomes smooth black powder without any shine
3. Step 3: *A. indica* leaves powder *Kwatha* (decoction) is prepared by boiling the powder in water (8 times) in a stainless-steel pot till the volume of water reduces to 1/4th. *Kwatha* is filtered through nylon cloth number 60 and collected in a suitable stainless-steel vessel and allowed to cool
4. Step 4: *Lauha Bhasma, Abhraka Bhasma, Tamra Bhasma, Shuddha Shilajit, Shuddha Guggulu,* and powder of herbs are added to *Kajjali* in the *Khalwa* and triturated well till a homogenous blend is formed. Then, *A. indica* leaves *Kwatha* is added to the blend in sufficient quantity to form a smooth homogenous semi-solid bulk. Small boluses of the bulk are dried in a tray dryer at a temperature not exceeding 60° C and subjected to granule preparation in a mixer. The granules are passed through the multi-mill to give the desired weight of 500 mg.

2. MATERIALS AND METHODS

In this article, an attempt is made to collect all the literary data about *Arogyavardhini Vati* from our treaties and all the research articles regarding *Arogyavardhini Vati* available till 2023. *Rasapanchaka* analysis of the drug is done by collecting the *rasa, guna, virya, vipaka*, and *prabhav* of the individual components of the formulation and analyzing them statistically. All these data are compiled and analyzed and the results obtained are presented.

3. RESULTS

3.1. *Rasapanchaka* Analysis of *Arogyavardhini Vati*[5]

To understand the mode of action of *Arogyavardhini Vati,* we need to analyze the *Rasapanchaka* of *Arogyavardhini Vati.* The following table shows the properties of all the ingredients of *Arogyavardhini Vati* shown in table 2.

Rasapanchaka analysis of *Arogyavardhini Vati* shows the following observations:

3.1.1. Rasa

Analysis shows that the formulation is *Tikta Rasa Pradhana* (27.59%) followed by *Kashaya* (24.14%) and *Katu* (20.69%) *rasa* shown in figure 1 and mention in table 3.

3.1.2. Guna

The observations show that *Arogyavardhini Vati* is predominant in *Laghu* (29.03%) and *Ruksha Guna* (29.03%) shown in figure 2 and are shown in table 4.

3.1.3. Virya

Analysis shows that the drug is *Ushna Virya* predominant (54.55%) shown in figure 3 and are shown in table 5.

3.1.4. Vipaka

The *Vipaka* was *katu* (54.55%) as per the data collected about the drug shown in figure 4.

3.2. *Anupana* (Adjuvant):[6]

The medicine *Arogyavardhini Vati* can be prescribed with various types of adjuvants as per the condition of disease pathology and the patients such as *Moong dal-Vigna radiate* (L.) R. Wilczek; *Masur dal-Lens culinaris* Medik.; *Arhar- Cajanus cajan* (L.) Millsp.; Ghee (ghee made from cow milk); Barley-*Hordeum vulgare* L.; *Parwal-Trichosanthes dioica* Roxb.; Curd (curd from cow milk); Milk (cow milk); *Urad dal-Vigna mungo* (L.) Hepper; Sugarcane juice; Jaggery; Butter Milk. *Dashamula kwatha* and *Punarnavadi kwatha.*

4. DISCUSSION

According to *Rasaratnasamucchaya*, *Bhaisajyaratnavali,* and *Bharatbhaisajyaratnakar,* the drug *Arogyavardhini Vati* possesses pharmacological action such as *Kusthanasaka* (can alleviate all types of skin disorders) indicated for 1 *mandal* (14 days). *Tridosha jvara nashaka* (fever arising due to involvement of three humors) indicated for 5 days. The drug is extremely beneficial in cirrhosis of the liver, jaundice, and in cases of poor liver functioning. It is used as an excellent measure for various types of acne problems, edema, and obesity. The drug is also useful for individuals suffering from indigestion and irregular bowel movements. It brings about the promotion of the digestive power of the body, clears body channels for the nutrients to reach the tissues, reduces inflammation, and acts as a tonic for the liver, heart, kidneys, uterus, rectum, and intestine. It is also beneficial for chronic fevers and water retention. The prolonged use of *Arogyavardhini Vati* benefits in disordered functioning of endocrine glands (low or high hormonal production) that leads to imbalanced growth of body and organs. It is a good remedy for the removal of excessive fat, and clearing various types of toxins from the body and helps in the reduction of accumulated cholesterol in the body. It is beneficial for the heart as it brings about the strengthening of the heart or cardiac muscles. It provides total health and makes the body free from all types of diseases and brings a balance between the three *Dosha*. The following clinical studies support the miraculous multipurpose action of *Arogyavardhini Vati*.

4.1. Studies on Pharmacological Action of *Arogyavardhini Vati*

4.1.1. Action on liver disorders

4.1.1.1. Hepatitis

In a double-blind trial of Antarkar *et al*., acute viral hepatitis was treated with *Arogyavardhini* and it showed significant hepatoprotective effects with the improvement in hepatitis.[7] Another case study of 53-year-old male patient with complaints of yellowish-colored urine, reduced appetite along with generalized weakness, nausea, and mild pain in the right hypochondriac region was treated with *Arogyavardhini Vati, Phalatrikadi Kwath,* Liv52 HB, and *Rohitakarishta,* etc. for 6 months. Significant improvement was observed in both subjective and objective parameters after the completion of treatment.[8]

4.1.1.2. Non-alcoholic fatty liver disease

In the study of Panda *et al*, *Arogyavardhini Vati* and *Phalatrikadi Kwatha* were selected for the study on NAFLD. The treatment was administered for a period of 12 weeks in one male and one female. Liver function test, hemogram, renal function test, and cholesterol profile along with ultrasound of the liver were performed on day 0, after 4 weeks, 8 weeks, and 12 weeks for both cases. Twelve weeks of treatment showed that the elevated liver enzymes and elevated liver echogenicity were normalized with no adverse effects.[9]

4.1.1.3. Alcoholic fatty liver

Fatty liver observed in heavy drinkers is largely caused by reduced fatty acid oxidation due to the decreased activity of the citric acid cycle as well as the release of free oxygen radicals. The hepatocytes hence accumulate large quantities of triglycerides (TG) resulting in micro and macro vesicular fatty changes. A study shows that *Aryogyavardhini Vati* is effective in alcoholic fatty liver. The assessment of patients for fatty grade changes through the USG revealed a 36.4% reduction.[10]

In an Open Randomized Clinical Trial, 40 patients with the features of AFL were screened and were allotted into two groups by random lottery method. The trial group was administered 500 mg of *Arogyavardhini Vati* and the control group Tablet LIV 52 DS twice daily with *Koshana jala Anupana* after meals for 90 days. Subjective parameters such as anorexia, vomiting, abdominal distention, abdominal pain, nausea, and fatigue and objective parameters such as USG abdomen and LFT blood reports were assessed before and after the treatment. The trial group with *Arogyavardhini Vati* showed significant changes compared to the control group.[10]

A case report of a 44-year-old male patient with jaundice, abnormal liver functions (high transaminases and hyperbilirubinemia), and positive hepatitis B marker and fatty liver diagnosed as acute viral hepatitis B and alcoholic liver disease (ALD) was administered *Arogyavardhini Vati.* After 72 days of treatment, significant improvement was observed in clinical findings, reduction in liver transaminases, and fatty infiltration. The patient became hepatitis B surface antigen negative.[11]

Another case report of ALD who presented with symptoms such as nausea, vomiting, swelling in bilateral foot, weakness in the body, reduced appetite, gradual weight reduction, and semisolid stool with frequency of 6–7 times/day associated with reduced appetite and frequent vomiting. *Arogyavardhini Vati* was administered for 2 months which showed significant changes both in subjective and objective parameters. After 7 months of treatment, the patient was free from complications.[12]

4.1.1.4. Chronic liver disease (CLD)

The reduction in hepatic cancer invasion, metastatic adhesion, and induction of apoptosis are observed in hepatocellular carcinoma. Few studies have reported that Ayurvedic medications have significantly increased the thrombocytes in thrombocytopenia of ALDs with a positive outcome in CLD.[13,14]

4.1.1.5. Ascites (Jalodara)

Arogyavardhini Vati is beneficial in the management of *Jalodara* with hepatomegaly, *Udarroga,* and *Shotha* (swelling). In a case study of *Jalodara,* significant improvement was seen in the signs and symptoms of the patient.[15]

4.1.1.6. Autoimmune liver disease

A case study report showed that Ayurveda complex regimen is excellent in the management of *Asatymyaja* or *Swabhava satmya viparyaya*, *Yakrit vikara* (autoimmune liver diseases).[16] *Snehana*, *Swedana*, *Nitya Virechana,* and *Vamana* are also found useful in CLD.[17]

4.1.1.7. Animal experimentations on Liver disorders and Arogyavardhini Vati

In a study, hepatoprotective effects of *Arogyavardhini Vati* were evaluated on paracetamol (PCM)-induced liver damage in rats. Effects of formulation were assessed on serum and liver tissue biochemical parameters and histopathological studies. PCM produced significant impairment of the liver and kidney functions as assessed through an increase in liver and kidney marker enzymes. *Arogyavardhini* treated group significantly ($P < 0.05$) prevented this hepatotoxicity and histopathological examinations revealed that *Arogyavardhini Vati* shows the protection of liver tissue from PCM-induced hepatotoxicity.[18]

One of the studies evaluated the hepatoprotective effects of *Arogyavardhini* on D-galactosamine (dGalN)-induced fulminant hepatic failure, where rats were administered an intraperitoneal injection of dGalN (270 mg/kg). *Arogyavardhini* (10 mg/kg and 50 mg/kg) was administered orally for 14 days continuously and 1 h before the d-GalN injection on the last day. Rats were sacrificed 24 h after the d-GalN. Silymarin (100 mg/kg body weight) was given orally as a standard hepatoprotective drug. The liver injury was assessed biochemically, investigating biochemical parameters such as alanine aminotransferase (ALT), activities of aspartate aminotransferase (AST), alkaline phosphatase (ALP), bilirubin, total protein, and albumin. The survival rates after the application of *Arogyavardhini* at 24 h were also observed. D-galactosamine administration induced a significant increase ($P \leq 0.01$) in total bilirubin associated with a marked elevation in the activities of AST, ALT, and ALP as compared to control rats. The pre-treatment of *Arogyavardhini* attenuated these changes in a dose-dependent manner. The survival rate was significantly higher than that of the control group. Therefore, *Arogyavardhini* may be used as a hepatoprotective agent against various liver diseases including toxic liver injury.[5]

4.1.1.8. Katuki (P. kurroa)

Katuki is one of the main ingredients of the *Arogyavardhini Vati* which has also been studied to assess its effect on liver disorders. Animal studies suggest that *P. kurroa* is effective in hepatitis B infection; normalizes bilirubin, SGOT, SGPT; prevents liver toxicity; and improves hepatic glycogen preservation. It also promotes liver regenerating activities by restoring cytochrome.[19,20]

4.1.2. Action on disorders of lipid metabolism

Hyperlipidemia is a major risk factor for coronary heart disease. In a study, anti-hyperlipidemic activity of *Arogyavardhini Vati* was evaluated against Triton WR-1339-induced hyperlipidemia in rats. Overnight fasted male Wistar rats (150–200 g) were randomly divided into a normal control group (4% dimethyl sulfoxide [DMSO], i.p.), positive control group (Triton WR-1339 in 4% DMSO, 400 mg/kg, i.p.), standard drug treated (fenofibrate 65 mg/kg, p.o. for 7 days after inducing hyperlipidemia), and *Arogyavardhini Vati* treated (50, 100, and 200 mg/kg, p.o. for 7 days after inducing hyperlipidemia). Rat

doses were calculated by extrapolating the equivalent human dose (therapeutic dose, sub-maximum, and maximum dose). *Arogyavardhini Vati* significantly decreased serum cholesterol, TG, LDL, and C-reactive protein (CRP) and significantly increased serum HDL in a dose-dependent manner. Decreased liver malondialdehyde (MDA) and increased glutathione (GSH) levels in the liver were observed at all doses of *Arogyavardhini Vati* (50, 100, and 200 mg/kg) and fenofibrate-treated groups when compared with triton-treated group. Atherogenic index level was significantly decreased in fenofibrate and *Arogyavardhini Vati* (200 mg/kg) treated rats when compared with normal control.[21]

Katuki has a choleretic effect.[22] *Amla* has HMG-CoA reductase inhibitory activity.[13] Ellagitannins and the ellagic acid obtained on hydrolysis of these tannins (by lipases and/or esterases) are inhibitors of squalene epoxidase, a rate-limiting enzyme of cholesterol biosynthesis.[14] These inhibitory activities may explain the beneficial effects of *Arogyavardhini Vati* on lipid parameters. Inflammation is known to reduce HDL[23] and the enhancement of HDL observed in the present study may arise from the control of inflammation by *Arogyavardhini Vati*. The serum CRP level which is a marker of systemic infection was also significantly reduced at the end of the treatment.[24]

4.1.2.1. Dyslipidemia

In a study, the safety and efficacy of *Arogyavardhini Vati* and *Arjuna* powder were evaluated for dyslipidemia patients. A total of 108 patients were screened and 96 patients were selected. *Arjuna* powder (5 g BD) for 3 weeks and then *Arogyavardhini Vati* (500 mg, BD) for 4 weeks were prescribed to the patients. The study was completed by 87 patients. There was a significant reduction in total cholesterol (TC), LDL, TGs, CRP, and blood glucose. A raised HDL level was observed. Safety assessment results showed no significant change in serum ALT, AST, ALP and bilirubin, urea, creatinine β2 microglobulins, and NGAL levels at the end of the study as compared to the baseline levels.[25]

4.1.2.2. Metabolic syndrome

In a study, 75 patients with metabolic syndrome were registered for the trial and randomly divided into two groups. Patients were treated with lifestyle modification mentioned for *Santarpanjanya* (disorders due to overnutrition) diseases with and without *Arogyavardhini Vati* for 8 weeks. Thirty-five patients in each group completed the course of treatment. Lifestyle modification alone and with the *Arogyavardhini* compound resulted in 1.32% and 3.06% decrease in waist circumference, 5.81% and 18.03% decrease in serum TGs, 4.43% and 6.89% decrease in systolic blood pressure, 3.82% increase and 2.48% decrease in fasting blood sugar, 9.13% and 5.56% increase in high-density lipoprotein, respectively. Significantly better results were obtained in the *Arogyavardhini* group.[26]

4.1.2.3. Animal study

In a study, Wistar rats were divided into five groups. The normal control group received a standard pellet diet. The HFD group received a high-fat diet rich in cholesterol. The HFD+*Arogyavardhini* group received HFD rich in cholesterol along with *Arogyavardhini* treatment. The HFD+zpter group received HFD rich in cholesterol along with zpter treatment. The standard control group received HFD rich in cholesterol and treatment with atorvastatin. Serum lipid profile estimation and histopathological estimations were done at the end. Group means were compared with an analysis of variance followed by Tukey's *post hoc* analysis ($P < 0.05$). HFD group shows a significant ($P < 0.05$) increase in TC levels (207.15 mg/dL) and TG levels (223.83 mg/dL) when compared with standard pellet-fed rats (TC = 151.05 mg/dl and TG = 164.67 mg/dL). Treatment with *Arogyavardhini* significantly ($P < 0.05$) reduces the increased levels of TC (160.123 mg/dL) and TG (189.5 mg/dL) in hyperlipidemic rats. Treatment with Zpter significantly ($P < 0.05$) reduces the increased levels of TC (163.89 mg/dL) and TG (193.167 mg/dL) in hyperlipidemic rats, which is comparable to standard treatment atorvastatin (TC = 155.81 mg/dL, TG=180.33 mg/dL).[27]

4.1.3. Action on skin diseases

4.1.3.1. Yuvan pidika

In a study, 30 patients between the ages of 16 and 36 years of both sexes with typical symptoms of *Yuvanpidika* were selected and divided equally into two groups. *Lodhradi Lepa* was topically applied with rose water to patients in Group A twice daily, whereas Group B was given *Arogyavardhini Vati* (500 mg) twice a day along with *Lodhradi Lepa* for 30 days. Pain, itching, burning sensation, swelling, redness, and the number of papules were assessed before and after treatment in both groups. Better improvement was seen in Group B (53.33%) compared to Group A (33.33%). Hence, *Arogyavardhini Vati* with *Lodhradi Lepa* is effective in the treatment of *Yuvanpidika*.[28]

4.1.3.2. Switra

In a case study, a 23 years old female patient of *Switra* was treated with Ayurvedic procedures such as *Krumighna Basti*, *Jalaukavacharan,* and medication such as *Arogyavardhinivati*, *Gomutra Haritakivati, Bakuchi GhanVati,* and local applications with *Shwitrahara Lepa* and *Bakuchi oil* and significant improvement was seen in *switra*.[29]

In another study, it was seen that *Arogyavardhini Vati* and *Samshamani Vati* were given internally and *Bakuchi churna* with *Gomutra* was used externally after *Virechana karma* was efficient in the management of *Switra*.[30]

4.1.3.3. Dadru

In a case study, it was found that a 31-year-old male was suffering from an elevated ring such as a patch around the buttock region, severe itching, discoloration/redness, and burning sensation since the last 8 months and was diagnosed as Dadru or Tinea cruris. *Arogyavardhini Vati* along with *Gandhak rasayan vati, Pachak vati, Gandharva haritaki vati, Mahamanjisthadi Kashaya, Panchavalkal* ointment, *Triphala, khadir,* and *Nimba avagaha* was helpful in relieving all the sign and symptoms.[31]

4.1.3.4. Vipadika

Arogyavardhini Vati, Raktapachak yoga, Khadirarishta, Eranda Haritaki, and *Jivantyadi yamakam* with *Koshna Jala* are very effective in *Vipadika* which is one form of the *Kushtha* with *Pani Pada Sputhana* (cracking of the skin in the palms and soles) and *Teevra Vedana* (severe pain) as the cardinal symptoms. It can be correlated with palmoplantar psoriasis having symptoms of fissuring of skin in the palms and soles, severe pain, burning, itching, and roughness.[32]

4.1.3.5. Dermatological manifestations of PCOS

A study including 110 women of 18–40 years diagnosed to have PCOS according to Rotterdam revised criteria 2003 were taken. Hormonal analysis as well as radiological assessment was done in all the cases. Out of 110 patients, 50 patients each were divided into two groups (excluding dropouts) named Group A and Group B. Group A received *Pathadi Kwatha* and *Arogyavardhini Vati* and Group B received *Kanchnaradi kwatha* and *Arogyavardhini Vati.* In this study, Acne was found in 44% of cases, Hirsutism in 84% of cases, Alopecia in 51%,

and *Acanthosis nigricans* in 34% of patients. The trial drugs *Pathadi kwatha* and *Arogyavardhini Vati* and *Kanchanaradi kwatha* and *Arogyavardhini Vati* are equally effective in reducing dermatologic manifestations of PCOS (*Dhatvagnimandya Janya Beejagranthi Vikara*).[33]

4.1.4. Action on Karnasrava

In a study, *Karnasrava* was found to be more prevalent in the lower strata of society and labor class workers. *Prakshalan* with *Arogyavardhini Vati* with *Panchakshiri Kwatha* was done. 43.33% of patients showed good responses and 56.67% showed moderate responses.[34]

In another case study, *Arogyavardhini Vati* and *Nimbaharidradi Dhoopana* were used to reduce the symptoms of *Karnasrava* with special reference to chronic suppurative otitis media (CSOM). *Nimbaharidradi Karna Dhoopana* was given for 7 days with 7 days gap for 2 sittings along with *Arogyavardhini Vati* 2 BD for 28 days. This gave significant relief to *Karnasrava*.[35]

4.1.5. Action in GIT disorders

Arogyavardhini Vati promotes digestive fire, clears body channels for the nutrients to reach the tissue, balances fats in the body, and removes toxins by improving the digestive system. It maintains the liver function as well as a healthy digestive system. *Tamra Bhasma* causes increased release of digestive juices and enzymes from organs. *Chitraka* present is responsible for *agnivardhana* (appetizer). *Arogyavardhini* heals diseases by normalizing the consumption, digestion, assimilation, absorption, and excretion physiology of *mahastrotas* (GIT).[36]

4.1.6. Hridya action of arogyavardhini

Arogyavardhini has been described as "*Hridya*." The vitiated *Rasa Dhatu* is unable to provide proper nourishment to the *Hridaya* causing *Hridaya Roga*. *Mala* of *Rasa Dhatu* is *Kapha. Kapha* also becomes *Dushta* due to *Rasa Dushti*. This *Dushta Kapha* causes obstruction in cardiac arteries which in turn hampers the necessary oxygen supply to cardiac muscles. *Arogyavardhini* does the *Pachana* of *Rasagata Dosha*. It destroys *Dushita Kapha* and reduces any *Srotorodha.* Hence it proves beneficial for the health of *Hridaya*.[37]

4.1.7. Action on hypertension

Vata is the main causative factor for hypertension as per Ayurveda. It may be due to obstruction or *Pitta* or *Kapha Avarana*. *Arogyavardhini Vati, Sutashekhar Rasa, Laghusutashekhar Rasa,* and *Rasapachaka Vati. Mahatikta Ghrita* is a useful medicine and *Virechana* and *Raktamokshana* are useful procedures with *Suryanamaskara* in hypertension.[38]

4.1.8. Antioxidant action

Arogyavardhini Vati has antioxidant properties. In a study, oxidative stress was induced in albino rats with carbon tetrachloride in all groups except control. In the control group, oxidative stress was induced without drugs. In the test group, three different concentrations of *Arogyavardhini Vati* (10 mg/mL, 20 mg/mL, and 50 mg/mL) were administered. In the standard group, Vitamin-c was used. Lipid peroxidation, GSH, catalase amylase, and superoxide dismutase levels were estimated for 4 days. In an antioxidant assay, *Arogyavardhini Vati* 10 mg/mL and 20 mg/mL showed a significant reduction of MDA concentration and significant improvement in GSH, superoxide dismutase, and catalase amylase activity.[1]

4.2. Study on the Pharmaceutical and Physicochemical Quality Control Parameters of *Arogyavardhini Vati*

In a study, *Arogyavardhini Vati* was prepared in one pilot and three main batches as per the classical reference of *Rasaratnasamucchaya*. Its physicochemical parameters, qualitative tests for functional groups, chromatography, and quantitative elemental estimation were investigated. An average of 2500 mL *Swarasa* was required for optimum *Mardana* for preparation of *Arogyavardhini Vati* from average 506 g of powdered raw drugs, leading to an average yield, % yield (as that of powdered drugs) % weight gain of 605 g, 119.56%, 99 g, and 19.56%, respectively. Functional groups of cardiac glycosides, alkaloids, tannins and phenols, proteins, carbohydrates, steroids, flavanoids, saponins, amino acids, starch, and sugar were present. HPTLC study revealed a total of 11 and 8 bands at 254 nm and 366 nm in *Arogyavardhini Vati*. It was concluded that there is uniformity among the results of observed and test parameters, among three batches. Pharmaceutical process, results of pharmaceutical study, physico-chemical tests, presence of functional groups, and HPTLC profile in the present study may be considered standard manufacturing process of *Arogyavardhini Rasa*.[39]

In another study, it was found that *Arogyavardhini Vati* prepared by the Ayurvedic classical method complies with the standard parameters as mentioned in Ayurvedic pharmacopeia of India. Hence, we may conclude that pharmaceutical and analytical parameters for *Arogyavardhini Vati* are validated by HPTLC method and can be considered the standard drug.[40,41]

4.3. Toxicity Studies of *Arogyavardhini Vati*

Arogyavardhini Vati contains mercury and copper compounds which leads to safety concerns due to the risk of mercury and copper toxicity. In an animal study, quantification of mercury and copper in *Arogyavardhini Vati* was done. Chronic hepatotoxicity was induced in the Wistar rats by repeated administration of CCl4 for 8 weeks. Treatment with *Arogyavardhini Vati* for 8 weeks exhibited significant accumulation of mercury in the kidney but not in the brain and liver. Similarly, no significant accumulation of copper was observed in the liver, kidney, and brain. Serum biochemical and histopathological changes were not affected by the treatment.[4]

In another toxicity study, *Arogyavardhini Vati* at doses of 50, 250, and 500 mg/kg (1, 5, and 10 times of human equivalent dose respectively), mercury chloride (1 mg/kg), and normal saline were administered orally to male Wistar rats for 28 days. Behavioral parameters were assessed on day 1, 7th, 14th, and 28th using the Morris water maze, passive avoidance, elevated plus maze, and rota rod. Results showed that there was no significant change in behavioral parameters, acetyl-cholinesterase activity, liver function (ALT, AST, ALP, and bilirubin), and kidney (serum urea and creatinine) function tests at all doses of *Arogyavardhini Vati* (50, 250, and 500 mg/kg) as compared to normal control. Normal cytoarchitecture was observed in the brain, liver, and kidney at all doses of *Arogyavardhini Vati.* Thus, *Arogyavardhini Vati* in doses equivalent up to 10 times of the human dose administered to rats for 28 days does not have appreciable toxicological effects on the brain, or liver. and kidney.[42]

A toxicity study of *Rasausadhis* including *Arogyavardhini Vati* on Wistar strain albino rats revealed that no mortality or significant signs of intoxication were observed in any control or drug-treated groups of animals throughout the study duration of 90 days. They found that *Rasaushadhi*-treated rats of both sexes exhibited the estimated pattern and similar body weight gain and feed consumption with those of control groups right through the dosing period, signifying normal growth, and development. Hematological and biochemical analyses revealed

no dose-dependent treatment-related alterations, and all the values remained within the normal physiological range of the tested animals.[43]

The results of a cell culture study show that *Arogyavardhini Vati, Sidh Makardhwaj, Ras Sindoor,* and *Kajjali* are non-toxic to HepG2 and HEK cells at doses up to 8 times of therapeutic dose. In an animal study, *Sidh Makardhwaj* up to 5 times and *Arogyavardhini Vati* up to 10 times the equivalent dose administered to rats for 28 days did not show any toxicological effects on the brain, liver, and kidney.[44]

In another study, it was found that *Arogyavardhini Vati* is not only safe in terms of heavy metal intake but apart from their therapeutic use, they are also beneficial as they supply some of the essential minerals most importantly iron which is usually deficient in the diet and minerals may have a synergetic effect on the activity of Ayurvedic medicines.[45]

4.3.1. Side effects

Hence, no reports are available concerning the adverse effects of this formulation. However, there should be some precautions as the formulation contains various minerals and heavy metals such as mercury as an ingredient which if not purified properly may prove to be dangerous for self-medication. Over-dosage may cause severe poisonous effects. It should be strictly avoided in pregnant, lactating women, and children.

4.4. Mode of Action of *Arogyavardhini Vati*

Arogyavardhini Vati contains ingredients such as *Haritaki* (*T. chebula*) which is astringent and laxative in nature. It is effective in relieving liver disorders. *Bibhitaki* (*T. bellirica*) is helpful in digestive disorders and is an effective anthelmintic. *Amalaki*-(*E. officinalis*) has antioxidative, antihepatotoxic, and immune modulator properties. It is an antibacterial, carminative, hypoglycemic, stomachic, hypotensive, and astringent agent. The mineral *Shuddh Shilajit* is useful in relieving kidney diseases, liver diseases, digestive disorders, and mental illness and is an effective agent for renewing vitality due to its powerful antioxidant properties delaying the process of aging. The oleo-gum-resin *Guggulu* (*Commiphora mukul*) converts cholesterol into bile helping to remove the unwanted fats and balancing the cholesterol levels. The herb *Chitrak* **(***Plumbago zeylanica*) is an effective agent in relieving digestive disorders such as loss of appetite, indigestion, piles, worms, colitis, and various liver diseases. Another important ingredient *Katuki* **(***P. kurroa***)** is an effective therapeutic agent in liver disorders. It is effective in liver damage caused by chemicals such as carbon tetrachloride, PCM, and even alcohol.

Arogyavardhini Vati contains *Kajjali*, which is *Yogavahi*, and it enhances the properties of other constituents thereby producing faster action and decrease in dose. *Bhasmas* along with *Kajjali* obtains deep penetration which enables *AV* to reach up to the cellular level giving higher efficacy and *Chedana* and *Bhedana* properties help to open the obstructed channels. All the components of *Arogyavardhini Vati* together have synergistic effects and show tremendous effects on various diseases affecting multiple systems.

Rasapanchaka analysis shows that *Arogyavardhini Vati* is *Tikta Rasa Pradhana* (27.59%) followed by *Kashaya* (24.14%) and *Katu* (20.69%) *rasa*, predominant in *Laghu* (29.03%) and *Ruksha Guna* (29.03%), *Ushna Virya* predominant (54.55%), and the *Vipaka* were *Katu* (54.55%). It has the ability of balancing *Tridosha*, destroying all types of skin disorders, analgesic, wound healing, and antipruritic properties, which helps in reducing symptoms of *Yuvanpidika*. Bitter taste, dry, and light properties are useful in destroying all skin disorders. Complexion-strengthening action of sweet properties improves the complexion of the skin and bestows ideal skin texture. Astringent property promotes wound healing and reduces secretions[46] and thus helps in reducing symptoms of skin diseases.

Arogyavardhini Vati does the *Shoshan* of different excess *Kleda* present in the ear. It also does the *Pachan* of *Drava* and *Kleda* and does the *Raktavardhan*. It reduces *Dravatva, Snigdhatva* in *Meda Dhatu*. According to *Panchmahabhoutikata Karnasrava* has *Prithvi* and *Jala Mahabhuta Pradhan*, whereas *Arogyavardhini Vati* has *Akash, Vayu,* and *Teja Mahabhuta Pradhanata*. Due to this *Mahabhuta Pradhanata,* it is helpful to reduce the *Karnasrava*.[34]

5. CONCLUSION

Arogyavardhini Vati is a herbomineral preparation which has miraculous effects on many diseases. *Rasapanchaka* analysis shows that *Arogyavardhini Vati* is *Tikta Rasa Pradhana* (27.59%) followed by *Kashaya* (24.14%) and *Katu* (20.69%) *rasa*, predominant in *Laghu* (29.03%) and *Ruksha Guna* (29.03%), *Ushna Virya* predominant (54.55%) and the *Vipaka* was *Katu* (54.55%). It has the ability of balancing *Tridosha* and is beneficial in many liver disorders, ascites, and autoimmune liver disease. Animal experiments also proved its hepatoprotective activities. It promotes liver regenerating activities by restoring cytochrome. It has antihyperlipidemic action and helps in metabolic syndrome mainly in *Santarpana Janya* diseases. It is beneficial in many skin diseases such as *Yuvan pidika, Switra, Dadru, Vipadika*, and dermatological manifestations due to PCOS such as acne, hirsutism, alopecia, and acanthosis nigricans. It reduces the pus discharge in *Karna Srava* or CSOM. It is *Agnivardhak*, *Hridya*, acts on hypertension, and also has antioxidant properties. Studies show that pharmaceutical and analytical parameters for *Arogyavardhini Vati* are validated by HPTLC method. Toxicity studies show that the formulation has no accumulation or toxic effect of mercury and copper on the vital organs of the body. Although many research and animal studies have proved the efficacy of *Arogyavardhini Vati* in the above-stated diseases still more research is required to explore the benefits of the preparation in other diseases also.

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This study did not need to be approved by the ethics committee of the institution as it is a review study.

10. CONFLICTS OF INTEREST

The author declared no potential conflict of interest.

11. DATA AVAILABILITY

This is a review manuscript and all data are available for only review purposes from the authors.

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Table 1: Ingredients of *Arogyavardhini Vati* with their quantity

S. No	Ingredients	Botanical name	Quantity
1.	*Shuddha Parada* (Herbal purified Mercury)	-	1 part
2.	*Shuddha Gandhaka* (Herbal purified Sulfur)	-	1 part
3.	*Loha Bhasma* (Ash prepared from Iron)	-	1 part
4.	*Abhraka Bhasma* (Purified and processed Mica)	-	1 part
5.	*Tamra Bhasma* (Ash prepared from copper)	-	1 part
6.	*Triphala* a. *Haritaki*-Chebulic Myrobalan fruit rind b. *Bibhitaki*-Belliric Myrobalan fruit rind c. *Amalaki*-Indian gooseberry fruit	a. *Terminalia chebula* Retz. b. *Terminalia bellirica* Roxb. c. *Emblica officinalis* Gaertn.	2 parts
7.	*Shilajatu* (Mineral pitch)	*Asphaltum*	3 parts
8.	*Pura-Guggulu*-Indian bedelium (gum resin)	*Commiphora mukul* Hook ex stocks	4 parts
9.	*Chitramool*-root of Indian-led word.	*Plumbago zeylanica* Linn.	4 parts
10.	*Tikta-Katuki*	*Picrorhiza kurroa* Royle ex Benth.	Equal of above
11.	Juice extract of *Nimba* leaf-Neem	*Azadirachta indica* A. Juss	As needed for making pill

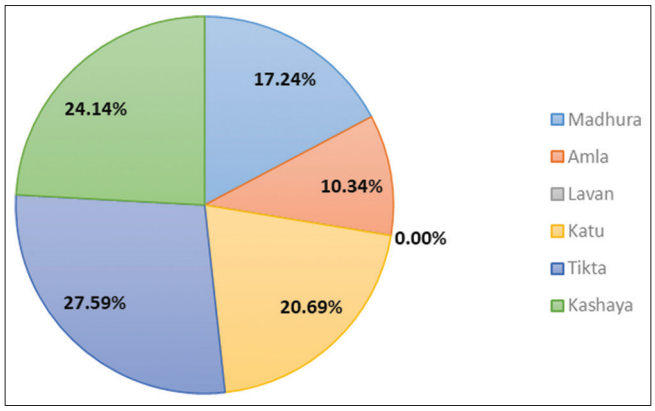

Figure 1: Incidence of Rasa in AV

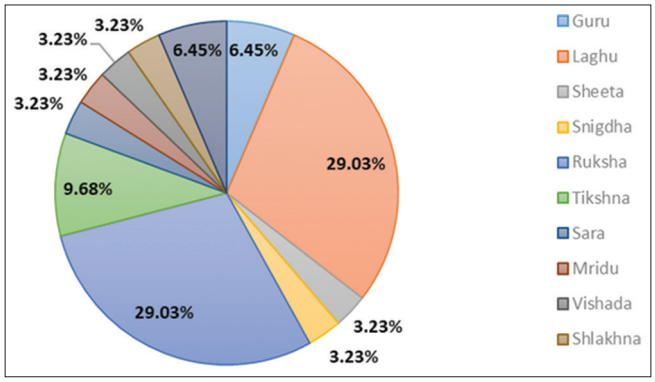

Figure 2: Incidence of Guna in AV.

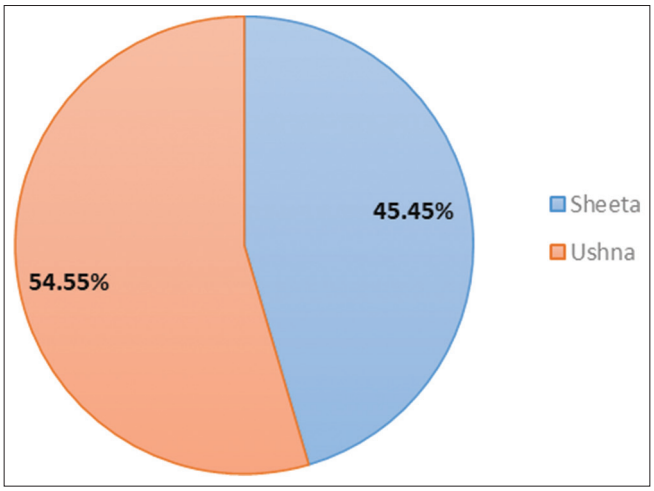

Figure 3: Incidence of Virya in AV

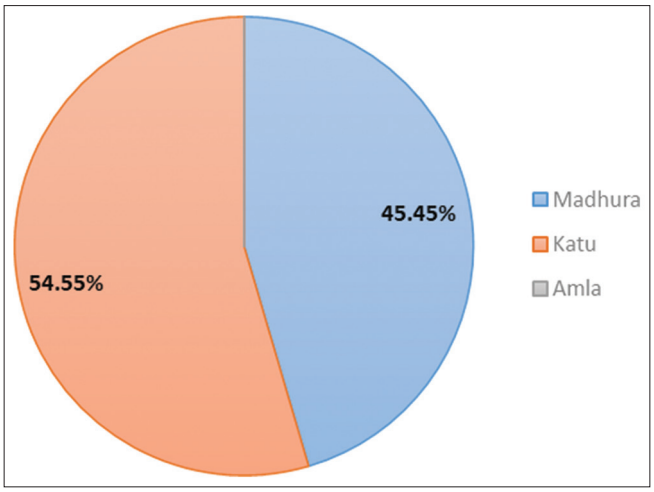

Figure 4: Incidence of Vipak in AV

Table 2: *Rasapanchaka* of Contents of *Arogyavardhini Vati*

S. No	Contents of *Vati*	*Dravya panchak*					*Karma*	*Rogaghnata*
		Rasa	**Guna**	**Virya**	***Vipaka***	***Prabhav Doshaghnata***		
1	*Kajjali*	*Niswadu*	*Mruduslakshan, sukshma*	*xxx*	*xxx*	*Tridosha hara*	*Yogavahi, Rasayana*	*Kajjali* when given with suitable *anupana* it alleviates diseases.
2	*Abhraka Bhasma*	*Madhura kashaya*	*Snigdha Laghu*	*Sheeta*	*Madhura*	*Tridosha hara*	*Paramam amrutam, Vitalizes memory, Allievates diseases, Aphrodiasic,*	*Kshaya, Pandu, Sangrahani, Shula, Kushtha, Jwara, Shwaas, Aruchi, Mandagni, Udar*
3	*Loha Bhasma Calcinated iron*	*Kaskaya, Tikta, madhura*	*Guru, Ruksha*	*Sheeta*	*Madhura*	*Aam doshaghana Tridoshaghana*	*Balya, Vrushya, Varnya, Medhya, Yogavahi, Rasayana, ayushya,*	*Pandu, Kamala, Shotha, Yakrut-Pleeha roga (*disorders of liver and spleen), Arsha, *Kushtha, Gulma, Udara, Sthaulya*
4	*Tamra Bhasma-Calcinated copper*	*katu, Tikta, Madhura, Amla*	*Laghu, Ruksha, Tikshna*	*Ushna*	*Katu*	*Pitta, Kapha*	*Param, Lekhkana, Urdwa- adho sanshodhak, Vishanashaka, Yakrut Vridhi nashak, Amahara*	*Parinaamshool, Udarashool, pandu, Jwara, gulma, Yakrit pleeha roga,(disorders of liver and spleen), Agnimandya, Prameha, Arsha, complicated Sangrahani.*
5	*Amalaki*	*Panchrasa, (Lavana rahita) Amla pradhan*	*Guru, Ruksha, Sheeta*	*Sheeta*	*Madhura*	*Sarva doshaghna*	*Vrushya, Rasayana*	
6	*Haritaki*	*Panchrasa (Lavana Varjita)*	*Ruksha, Laghu*	*Ushna*	*Madhura*	*Tridoshahara*	*Bruhani, Anulomani,*	*Arsha, Kushtha, Shotha, Udar, Krimi, Visarpa, Grahani, Vibandha, Vishamjwara, Kamala, Pleehaghana, Yakrut vicar*
7	*Bibhitaki*	*Kashaya*	*Ruksha, Laghu*	*Ushna*	*Madhura*	*Tridoshahara*	*Bhedana*	*Krimi, Kasa, Chardi, Keshya*
8	*Shuddha Shilajeet*	*Tikta, Kashaya, Katu*	*Laghu, Ruksha*	*Ushna*	*Katu*	*Kaphahara, Tridoshaghna*	*Rasayana, Yogavahi, Sarvarogahara*	*Kaphaja roga, Kshaya, Prameha, Gulma, Pleeha, Udar, Hrutashula, Agnimandya, Twakaroga, Medachedakaram*
9	*Chitraka moola*	*Katu*	*Ruksha, Laghu, Tikshna*	*Ushna*	*Katu*	*Kaphaghana*	*Vanhi kruta*	*Grahani, Kushtha, Shotha, Arsha, Krimi*
10	*Guggulu*	*Tikta, Katu*	*Laghu, Ruksha, Tikshna, Vishada, Sukshma, sara*	*Ushna*	*Katu*	*Tridoshahara*	*Shothaghna, Lekhana, Vrushya*	*Krimi, Ashmari, Prameha, Kustha, Amavata, Granthi*
11	*Kutki*	*Tikta*	*Ruksha, Laghu*	*Sheeta*	*Katu*	*Kapha Pittahara*	*Deepana, Bhedanam, Lekkhana, Yakrit uttejaka, Stanya Shodhanam, Shothaharam, Kushagnam*	*Kushta, Prameha, Vishamajwara, Shwasa, Kaasa, Kamala, Yakrut vikaram*
12	*Nimba patra swaras*	*Tikta Kashaya*	*Laghu*	*sheeta*	*Katu*	*Kapha Pitta Shamaka*	*Jantughna, Vrana Pachana, Kusthaghna Krimighna, Vedanasthapana Balya, Amapachana, Jwaraghna, Rochana*	*Kustha, Prameh, Vishamajwara, Phiranga, Dhatukshaya, Yakritvikaram, Madhumeha, Jeernajwar*

Table 3: Showing rasa analysis of AV

Rasa	***n***	**%**
Madhura	5	17.24
Amla	3	10.34
Lavan	0	0.00
Katu	6	20.69
Tikta	8	27.59
Kashaya	7	24.14

Table 4: Guna analysis of AV

Guna	***n***	**%**
Guru	2	6.45
Laghu	9	29.03
Sheeta	1	3.23
Snigdha	1	3.23
Ruksha	9	29.03
Tikshna	3	9.68
Sara	1	3.23
Mridu	1	3.23
Vishada	1	3.23
Shlakhna	1	3.23
Sukshma	2	6.45

Table 5: Virya analysis of AV

Virya	***n***	**%**
Sheeta	5	45.45
Ushna	6	54.55

Table 6: Vipaka analysis of AV

Vipaka	***n***	**%**
Madhura	5	45.45
Katu	6	54.55
Amla	0	0.00