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A Case Series of Dyslipidemia Managed with Kutaki (Picrorhiza Kurroa Royle Ex Benth)

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ABSTRACT

Background: Raised total cholesterol, high LDL-C, low HDL-C, and elevated triglycerides are all symptoms of dyslipidemia. It is included in metabolic disorders. It is a major component in causation of atherosclerosis, coronary artery disease and cerebrovascular disease. There is a 1-2 percent rise in the incidence of Coronary Heart Disease for every 1% increase in cholesterol level. As per Ayurveda, it can be considered as a Medadhatu Dushti that is "Medoroga". Acharya Charaka described drugs having deepana, pachana, medohar, lekhana and strotoshodhaka properties for management of Medoroga. Kutaki (Picrorhiza kurroa Royle ex. Benth) can be used in such conditions due to its lekhana and medohar properties.Various animal research studies conducted on Kutaki proved its antihyperlipidemic and hepatoprotective property. Hence in this case series three patients of dyslipidemia were treated with single dravya Kutaki in tablet form.
Case Report: All the three female patients, aged between 40 to 50 years, were treated with Kutaki tablet (500mg) two times a day in the morning and evening (8am-8pm) empty stomach with water for 60 days. After completion of treatment, assessment was done by comparing Serum lipid profile value as with baseline after completion of treatment.
Observations and Result: All the three patients showed improvement in lipid values. There was no change in weight or BMI was noted.
Conclusion: Hence, it can be concluded that Kutaki is safe and effective in dyslipidemia for normalization of lipid in the blood due to its lekhana, Kapha-Medohara (alleviation of vitiated Kapha and Meda) properties.

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INTRODUCTION

Dyslipidemia is characterized as an increase in total cholesterol, low density lipoprotein (LDL) cholesterol, and triglyceride levels in the blood, as well as a reduction in high density lipoprotein (HDL) cholesterol levels [1]. A major risk factor for coronary heart disease (CHD) is dyslipidemia [2].When compared to people with normal lipid levels, people with dyslipidemia have a twofold greater risk of getting CVD [3].CVD is becoming more common over the world, and it is one of the leading causes of death[4]. Increased levels of specific lipids in the blood raise the risk of atherosclerosis, which is known to be the leading cause of stroke, peripheral vascular disease, and coronary heart disease [5]. Dyslipidemia is linked to more than half of all cases of ischemic heart disease worldwide, as well as more than 4 million fatalities per year [6]. Dyslipidemia was found to be prevalent in 25.5 percent of the adult population in Africa.

Furthermore, the overall prevalence of high total cholesterol, high LDL-C, low HDL-C, and raised triglyceride was 25.5 percent, 21.4 percent, 19.5 percent, and 17.0 percent [7]. In Eastern Ethiopia, advanced age, elevated FBG, coffee consumption, and vegetable intake were found to be significant predictors of dyslipidemia among contraceptive users [8].

Dyslipidemia is not mentioned in Ayurveda, but the symptoms can be correlated with Meda Dhatu dushti (abnormality in adipose/fatty tissue) and it can be included under Santarpanjanya vyadhi (disease caused due to over nutrition) as "Medoroga". In Ayurveda, it is considered that Agni is responsible for all metabolic processes in the body. Good health is maintained by proper functioning of Agni. Derangement of Agni causes imbalance of Dosha, Dhatu and Mala. Mandagni (Decreased digestive fire) is the root cause for formation of all diseases. When Mandagni is present at the level of Meda Dhatu then successive formation of Dhatus will not take place and Apachita Meda Dhatu (partially formed adipose/ fatty tissue) formed in excess. This excess formed Meda Dhatu gets accumulated in the body causing Medoroga[9].

In Ayurveda, Aam is the primary cause of all metabolic problems.. The Ama and excess formed apachit meda dhatu causes obstruction in the strotasa (channels) leading to the disease formation. Cholesterol is one such product that is formed as a result of a metabolic disturbance in fat metabolism.

Correction of Agni, aampachana (digestion of ama) and medanashana (reduction of fat) is the best for breaking the samprapti (Pathogenesis). Hence to treat this condition the drugs should be used having deepana (appetizer, pachana (digestive), lekhana (scraping), medohar (causing fat reduction) and strotoshodhaka (channel cleansing) properties [10]. Kutaki (Picrorhiza kurroa Royle ex. Benth) can be used in such conditions due to its lekhana and medohar properties [11,12].Many animal research studies conducted on Kutaki proved its antihyperlipidemic and hepatoprotective property [13,14]. Hence single drug Kutaki in the form of tablet was selected to treat the cases of dyslipidemia after taking his consent.

CASE STUDIES

Case 1: A 41 years old female (OPD no.1903070031) came with Chief complaints of neck stiffness, dizziness, feeling of mild tightness in chest and tiredness from 4 to 6 months.

Present illness history: Prior to 6 months, she was in good health and after that she slowly started stiffness in neck, feeling of dizziness, feeling of mild tightness in chest and tiredness from 6 months.

Past illness history: There was no history of raised Blood pressure, hypothyroidism, diabetes mellitus, or asthma in the past.

History of the Family: Her mother was suffering from diabetes mellitus.

Personal history revealed that she was taking meals twice a day. She was on a mixed diet. She slept one hour daily in the daytime and was a housewife. She was taking 6-8 hours of sleep but her sleep was disturbed. She had no history of any habit and had moderate stress. She was not doing physical exercise.

Drug History: There was no history of drugs.

Clinical Examination: The patient's weight was 59 kg, her height was 152 cm, her body mass index (BMI) was 25.5 kg/m2 (overweight), her blood pressure was 120/80 mm Hg, and her pulse rate was 74 beats per minute. Her vital parameters were within normal limits. Her Prakriti (body constitution) was Vatakaphaja with sama Agni (normal digestive fire), Madhyama Satva (moderate mental strength) and madhyam Koshtha. Her ashtavidha pariksha was within normal limits. Her physical and systemic examinations were within normal limits.

Case 2: A 50 years old female (OPD NO. 1903170063) came for having symptoms like pain in joints, giddiness, feeling restlessness and constipation since six to eight months

Present Illness History: Prior to 8 months patient was in good condition, and then she progressively started pain in joints, giddiness, and restlessness from 8 months.

Past History: She had a history of facial paralysis 15 years back.

Family History: Father had history of Right hemiplegia.

Personal history revealed that she was taking breakfast in the morning and meal twice a day. She was on a vegetarian diet. She was not doing any type of exercise and had a habit of tea consumption 3-4 times since 10 years. She had a history of irregular, disturb and inadequate sleep and had mild stress. She has been suffering from osteoarthritis for 3 years.

Drug History: She was taking on analgesic drugs on and off.

Clinical Examination: The patient's weight was 45 kg, her height was 149 cm, her BMI was 20.3 kg, her blood pressure was 120/80 mm of Hg, and her pulse rate was 80 beats per minute. Her vital parameters were within normal limits. Her Prakriti (body constitution) was Pittakaphaja with manda Agni (decreased digestive fire), avarsatva (less mental strength) and krura Koshtha. Her physical and systemic examinations were within normal limits.

Case 3: A 50 years old female (OPD NO.1911180028) suffering from lumbar pain, heaviness in the body, and lethargy from 2-3 years visited for treatment.

Present Illness History: Prior to three years she was in good health, afterthat she slowly started lumbar pain with feelings of heaviness and lethargy. She gave a history of weight gain with no change in dietary habits or lifestyle. She was suffering from hypertension and was on regular antihypertensive since 4-5 years.

Past History: There was a history of Jaundice one year ago. There was no history of Hypothyroidism and Asthma.

Family History: Father had history of Myocardial infarction at the age of 58.

Personal history revealed that she was taking morning breakfast and meals twice a day. She was on a vegetarian diet. She was doing daily exercise of walking 1 km. and had not indulged in any habits. She had a history of day time sleeping for 1 to 2 hours daily and had adequate sleep.

Drug History

She had a history of taking regular antihypertensive medicine (Telmisartan 10 mg) since 4-5 years.

Clinical Examination

The patient's weight was 68 kg, her height was 151 cm, her BMI was 28.3 kg/m2 (class I obesity), her blood pressure was 120/90 mm Hg, and her pulse rate was 76 beats per minute. Her vital parameters were within normal limits. Her Prakriti (body constitution) was Vata Kaphaja with Sama Agni (normal digestive fire). Her mental strength showed moderate strength (Madhyama Satva) and Koshtha was madhyama. Her physical and systemic checks revealed that she was in good health.

Investigations done

1.Lipid profile-
-Serum Total Cholesterol
-Serum Low Density Lipoprotein (L.D.L)
-Triglycerides
-High Density lipoprotein (H.D.L)
-VLDL (Very Low Density Lipoprotein)
2.Fasting Blood Sugar level
3.LFT- Liver function test
-AST (Aspartate aminotransferase)
-ALT (Alanine aminotransferase)
4.KFT- Kidney function test
-S.Creatinin
-S.Urea

Diagnosis

According to the Adult Treatment Panel 3 of the National Cholesterol Education Program, the following range of readings have been used to diagnose dyslipidemia [15].

- >200 mg/dl cholesterol in the blood
- Triglycerides in the blood >150 mg/dl
- >130 mg/dl Serum Low density lipoprotein
- HDL cholesterol in the blood is less than 40 mg/dl.

All three cases were diagnosed to have dyslipidemia as per their lipid values mentioned in National Cholesterol Education Program Adult Treatment Panel 3.

Treatment Given: Details shown in table no. 1

OBSERVATIONS AND RESULTS-

Assessment of the patient was done at the beginning of treatment on day 0 and after completion of treatment on day 60 shown in table no 2 and 3.

In this study total three patients were treated for 60 days with Kutaki tablet. The disease is prevalent in male than in female but in this study all three enrolled patients were female. All three cases were within 40 to 50 years of age group having housewives. Case 1 and case 3 had Vatakaphaja prakriti while case 2 had pittakaphaja prakriti. The history of daytime sleep (diwaswapa) was present in case 1 and case 3 and was absent in case 2., which is one of the causes mentioned for Medoroga in Ayurveda as it aggravates Kapha and meda. Out of three two patients (Case 1 & 3) as shown in table no. 2, had a BMI more than normal showing a tendency towards obesity. One of the patients (Case 3) had a history of hypertension and was taking antihypertensive medicines regularly. Past history of facial paralysis was present in case 2 whereas past history of jaundice was present in case 3. Family history of hemiplegia (in case 2) and myocardial infarction (in case3) was present in two cases whereas case 1 had positive family history of diabetes mellitus. As dyslipidemia is associated with genetic factors, positive family history increases the incidence. History of physical exercise like walking was present in only case 3 whereas it was absent in case 1 and case 2. Sedentary lifestyle and lack of exercise increases risk of dyslipidemia. Moderate type of stress was present in two cases which also increased the chance of disease occurrence.

After completion of treatment as shown in Table no. 1, the data were evaluated, and it revealed an improvement in lipid profile parameters (serum cholesterol, low-density lipoprotein, low-density lipoprotein, and triglyceride) in all three patients. The body weight and BMI showed no change. Assessment of body weight and BMI has been shown in Table 2 and reduction in lipid parameters have been shown in Table 3. The patient felt lighter in the body after the treatment was over. In all three patients, there were no significant changes in blood ALT, AST, urea, or creatinine levels after treatment as compared to baseline levels. [Table 3]. Thus there was no hepatic or renal toxicity noted in all the three cases. During treatment, the patients were advised to follow their routine daily lifestyle as it is.

DISCUSSION

In Charaka Samhita, Nidan Parivarjana (avoidance of causative agents) Shodhana (Five purification measures) and Shamana Chikitsa (systemic internal medication) is described for the management of Medoroga. In Shaman Chikitsa deepana (appetizer), pachana (digestive), and lekhana (scraping) drugs are described for agnidipana (appetite stimulation) and amapachana (digestion of undigested/partially food). Various herbs described in Ayurveda having lekhana and kaphamedahar dravyas are described which can be used in Medoroga[16,17].

Kutaki (Picrorhiza kurroa Royle ex. Benth) is one of the lekhana dravya described in Charaka samhita in Lekhaniya mahakashaya (Class of drugs causing scraping action). Lekhana and ruksha drugs like Kutaki, Yava (barley), Musta are beneficial in reducing Meda and Kapha1[18]. In Samhita, Kutaki is described as having Tikta Rasa (bitter taste), Ushna Virya (hot potency), Agnideepan, Pachana, and Lekhana properties and it is mainly used in all types of liver disorders like Jaundice and blood disorders [19]., Amaghni is the name given for Kutaki in Dhanvantari nighantu for its property of

removing Ama and thus it helps to cure the diseases. It stimulates and gives strength to the liver.

Probable mode of action of Kutaki

Kutaki possess Kaphamedahar property which helps to alleviate the increased Kapha and Meda. Mandagni gets corrected by Agnideepan property of Kutaki, amapachana property helps to remove Ama and improves liver function which leads to breaking Samprapti (pathogenesis). Lekhana property helps in scraping action thereby aids in removing accumulated Meda. Kutaki has a direct effect on the functioning of the liver. Once the functioning of the liver is corrected, the synthesis of cholesterol may be checked and excretion of cholesterol may be increased by stimulating bile production and secretion.

The choleretic action of P. kurroa is known. It contains iridoid glycosides (including picroside I, II, III, pikuroside, kutkoside, and 6-feruloyl catalpol), organic acids such as vanillic and cinnamic acids, glycosides like cucurbitacin, androsin, and apocynin.[20] Its pharmacodynamic activity on lipids primarily relevant to lipid diseases can be predicted based on these qualities. [21]

Picroside I have already been demonstrated to be active in various liver damage models. [22]. In a 12-week trial in mice fed a high-fat diet, 50-200mg/kg of Picrorhiza kurroa daily appeared to correct most lipid metabolic markers (triglycerides, cholesterol, LDL-C) while having no effect on HDL-C; these changes were assumed to be attributable to assisting the liver[23]. PX-407-induced lipid changes have also been observed elsewhere24. It has hepatoprotective, anti cholestatic, antioxidant, antidiabetic, and immune-modulating properties. Kutaki's hepatoprotective properties can be ascribed to its ability to scavenge free radicals. It has also been demonstrated to accelerate liver regeneration in rats, most likely through increased nucleic acid and protein synthesis.

Picrorhiza restored reduced glutathione levels in malaria-infected rats, improving detoxification and antioxidation and preserving a normal oxidation-reduction balance (Chander et al., 1992). [25]

Dyslipidemia is a lifestyle disorder and is related with unhealthy dietary habits, obesity, consumption of alcohol, habits like smoking, tobacco, tea, family history, presence of hypertension, diabetes mellitus and obesity. All risk variables do not play a role in disease development, but they differ from person to person. It is not necessary for all etiological components to be present in the pathogenesis of dyslipidemia; nonetheless, the presence of certain of them can induce it. [26] In this study obesity, lack of exercise and positive family history can be the cause for dyslipidemia.

CONCLUSION

Unhealthy food habits, sedentary lifestyle, stress and positive family history are the major contributing factors for dyslipidemia. Kutaki is helpful in reducing increased total cholesterol, increased triglycerides and low-density lipoproteins with an increase in high density lipoproteins without affecting liver and kidney functions in all the three cases of dyslipidemia.

RECOMMENDATIONS

It is recommended to conduct comparative study on a large number of patients with dyslipidemia to prove efficacy of Kutaki and also for longer duration to prove its safety.

Financial support and sponsorship

Nil

Conflicts of interest

There are no conflicts of interest.

Declaration of patient's consent

The authors declare that they have taken patient consent regarding sharing clinical information to be reported in the journal and assured that their identity will be conceal.

Ethical approval

Ethical approval not applicable as this is a single case study including similar treatment modality to three patients of Dyslipidemia. Kutaki is used in many Ayurvedic formulations as well as single drug in many conditions. It is lekhan drug having hypolipidemic action so there is no ethical issue.

Authorship contributions

All the three Authors participated in planning treatment plan, assessment and writing of manuscript.

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