Original Research Article

The effect of Laja in dyslipidemia: an interventional pre-post test

Renjumol V. S.*, Sajeeshan A. K., Sheela S.

Department of Swasthavritta, Govt. Ayurveda College, Tripunithura Ernakulam, Kerala, India

*Correspondence:
Dr. Renjumol V. S.,
E-mail: dr.renjumol@gmail.com

ABSTRACT

Background: Dyslipidemia is a lipoprotein metabolism disorder and a major risk factor for Cardio Vascular Diseases. The National Cholesterol Education Programme (NCEP) guidelines suggest dietary modifications, exercise and weight control as the main foundation of dyslipidemia treatment. Dyslipidemia can be considered as a *kapha medoja vikara*, managed with correction of *agni and kaphamedahara* drugs. *Lāja* (puffed rice) is an *aharadravya* ideal in this condition because it is having *kaphamedahara* property.

Methods: This study was conducted at Govt. Ayurveda College, Tripunithura as an interventional pre-post study with control group to find out solution for normalizing lipid profile by changing diet without therapeutic medicine. 30 Participants were allotted in each groups by consecutive sampling and advised to follow diet restriction and exercise for both groups. In addition the study group consumed the *Lāja peya* two times daily before food. Study period was 90 days and assessment taken in 0th, 46th and 91st day.

Results: The results showed significant effect on lipid profile in both groups. But in comparison to control group, the study group showed highly significant reduction in Total cholesterol, LDL, VLDL and Triglycerides and not in increasing HDL.

Conclusions: *Lāja* which contains rice bran, low in fat and has *Kashaya Madurarasa, lakhu alparooksha guna, agnideepana*, *kaphachidah* and *medahara* property, that helps to digest the food properly and correct the metabolism. Thus *laja peya* has a beneficiary role in reducing Total cholesterol, LDL, VLDL and Triglycerides and there is no role in increasing HDL.

Keywords: Agni, Dyslipidemia, *Lāja*, Kaphamedaja Vikaras

INTRODUCTION

Dyslipidemia is a disorder caused by defective lipid metabolism. Unhealthy diet, lack of exercise, genetic disorders, and certain drugs are the main factors causing dyslipidemia.[1] It is one among the major modifiable risk factors of cardio vascular diseases and stroke. Worldwide cholesterol levels are estimated to cause 56% ischemic heart disease and 18% Strokes amounting to 4.4 million death annually.[2] As Per NCEP guidelines dietary modifications, exercise, and weight control are the main foundation of treatment of dyslipidemia and thereby reducing the risk of cardiovascular disease and stroke.[3]

In *Ayurveda* dyslipidemia does not bear a precise reference. In *charakasamhita sutrastana Medodoshaja rogas* described in *Atisthooladirogas* and *Prameharoga poorvaroopas. Santharpana medojanyarogas* are; *Prameha, Kandu, Pitaka, Kota, Pandu, Jwara, Kushta, Amadoshaja rogas, Atisthoulyam* etc.[4] *Acharya Adhamala* (Commentator of Sarangdhar Samhita) also describes *the medodhatu vikriti* and divided it into two groups. (i) *Medoroga (ii) Medodusti*.[5] So there is involvement of

kapha and *medas* along with *vishamagni* or mandagni in dyslipidemia. For managing dyslipidemia *kapha* and *medas* should be reduced along with normalizing *agni*.[6]

Lāja or brown puffed rice is one among the *aharavarga (krithaannavarga)* used as a remedy for *kaphameda* predominant conditions.[7] It has great nutritional values. In modern researches, it has been found that *Lāja* has good portion of digestible nutrients. It is rich in carbohydrate (88%), low fat (0.2%), protein (8.6%), low salt, low cholesterol, contains rice bran, easily digestible and immediate source of energy (high calorific value1,754/pound), makes it healthy nutritive and balanced diet.[8] *Lāja* can be used as a diet as well as medicine in many diseases like *Trit, Chardhi, Meha, Meda ,Atisara etc. Lāja has Kashaya madhura rasa, Seetha veerya, Alpa rooksha, laghu guna and deepana* property. It pacifies *Pitta* and *kapha* and doesnot aggrevate *vatha*.[7]

This study aimed to evaluate the effect of Lāja in dyslipidemia by reduction in level of serum cholesterol, serum triglyceride, serum LDL, serum VLDL and Increase in level of serum HDL.

METHODS

Study area

An interventional study pre post study with control group conducted in the OPD, Govt. Ayurveda College Hospital, Tripunithura, Kochi.

Study period

Study was conducted From November 2016 to May 2017.

The current study was conducted at Govt. Ayurveda College, Tripunithura, Kochi, to assess the effect of *Lāja* along with diet restriction and exercise. For the study, 60 Patients satisfying inclusion and exclusion criteria were selected from OPD, Govt. Ayurveda College, Tripunithura, assigned into 2 groups. All 60 patients were advised to follow diet restriction (avoid junk and fried food items) and exercise (30 minutes Morning walk). In addition 30 patients in the study group were advised to take *Lāja* during the 90 days of study.

Laja was prepared by boiling 10 gm (5 table spoon) of Laja in 200ml of water for 5 minutes and administered two times daily, 7am and 6pm for 3 months. Lipid profile assessment were done on 0th, 46th and 91st day of the study.

Inclusion criteria

Individuals from both sex, patients between the age group 30-50 years, ranges between in any one of the following parameters: serum cholesterol between 200-250 mg/dl, HDL level between 35-45 mg/dl, LDL level between 100-159 mg/dl, VLDL level between 30-40 mg/dl, and triglycerides level between 150-199 mg/dl were included.

Exclusion criteria

Patients with uncontrolled diabetes, patients are known to have history of systemic disorders like cardiac diseases, endocrinal disorders, thyroid dysfunction, liver diseases, kidney disorders, and pregnant woman and lactating mother were excluded.

Statistical analysis

Analysis of each group was done by paired t test/Wilcoxon signed Rank test and comparison between groups was done by unpaired t test /Wilcoxon Mann-Whitney U test. The obtained results were statistically analyzed and compared in between two groups.

RESULTS

In this study, the lipid profile variations of 30 patients each in both study and control groups were analyzed by comparing, before treatment and after treatment - mean difference, by Paired t Test and the comparison of two groups analyzed by Unpaired t test except in the analysis of triglycerides. Triglycerides of each groups of before and after treatment results were compared by Wilcoxon Signed Rank Test and the two groups were compared by Mann Whitney Test.

Table 1: Effect on total cholesterol.

In study group								
				Paired difference				
Stage	Mean	SD	NO	Pair	Mean	SD	t value	p value
BT	227.53	11.252	30	BT vs AT	55.05	15.265	19.914	P<0.001
AT	172.03	10.394	30					
In control group								
BT	224.33	11.499	30	BT vs AT	12.933	3.591	19.729	P<0.001
AT	211.40	11.075	30					

Table 2: Effect on triglyceride.

In study group								
				Paired difference				
Stage	Mean	SD	NO	Pair	Mean	SD	t value	p value
BT	178.03	14.160	30	BT vs AT	40.233	13.788		P<0.001
AT	137.80	6.687	30					
In control group								
BT	172.03	13.535	30	BT vs AT	12.900	3.633		P<0.001
AT	159.13	11.455	30					

Table 3: Effect on HDL level.

In study group								
				Paired difference				
Stage	Mean	SD	NO	Pair	Mean	SD	t value	p value
BT	40.333	3.830	30	BT vs AT	-9.900	3.907	13.978	P<0.001
AT	50.333	5.851	30					
In control group								
BT	39.333	3.754	30	BT vs AT	-8.433	2.991	15.445	P<0.001
AT	47.767	5.649	30					

Table 4: Effect on LDL level.

In study group								
				Paired difference				
Stage	Mean	SD	NO	Pair	Mean	SD	t value	P value
BT	151.47	9.247	30	BT vs AT	57.267	14.969	20.954	P<0.001
AT	94.200	12.375	30					
In control group								
BT	150.47	9.705	30	BT vs AT	18.633	5.708	17.879	P<0.001
AT	131.83	9.844	30					

Table 5: Effect on VLDL level.

In study group								
				Paired difference				
Stage	Mean	SD	NO	Pair	Mean	SD	t value	p value
BT	35.633	2.895	30	BT vs AT	8.133	2.813	15.837	P<0.001
AT	27.500	1.333	30					
In control group								
BT	34.533	2.776	30	BT vs AT	2.733	0.8277	18.088	P<0.001
AT	31.800	2.265	30					

Both groups statistically calculated by using paired t test and that shows statistically significant results. The mean difference of the Study Group and Control Group were compared and the result was highly significant (Table 1).

Comparison of Study Group with Control Group was analyzed by Using Mann Whitney Test. After Treatment values of both groups were compared and the obtained result was statistically highly significant (Table 2).

The mean difference of the Study group and Control group were compared, by using Unpaired t test, and the P value was <0.001, considered highly statistically significant (Table 3).

The mean difference of the Study group and Control group were compared, by using Unpaired t test, and the P value was <0.001, considered highly statistically significant (Table 4).

The mean difference of the Study group and Control group were compared, by using Unpaired t test, and the P value was <0.001, considered highly statistically significant (Table 5).

After comparing both study group and control group the results were found to be extremely significant in reducing the total cholesterol VLDL cholesterol and LDL cholesterol but the HDL were found to be not significant.

DISCUSSION

Dyslipidemia is a condition formed due to the involvement of *kapha* and *medas*. So the drugs having *agni deepana* and *pachana* property helps to correct the *medo datwagni* and the proper formation of *medo dhatu*.[9] This study was conducted to find out the solution for normalizing the lipid profile without therapeutic medicines by the changing diet habit and reducing the risk of occurrence of cardio vascular diseases and stroke. In this present study, the patient was given *Lāja peya* as a diet two times daily before food for 3 months. Study shows that *Lāja manda* having the properties like stimulate digestive fire, light to digest, increases appetite, reduces urine output, imparts strength and nourish *dhatu*s is used for *amapachana* and correct the *mandagn*i.[10]

Lāja have *Kashaya, Madura rasa, lakhu alparooksha guna, agnideepana, kaphachida* and *medahara* properties. Though possessing *lakhu rooksha guna* and *seetha veerya*, *Lāja* pacifies *vata* because of *madura rasa*. *Madura rasa* and *seetha veerya* of *Lāja* also helps to pacify the *pitta dosha*. Its *Kashaya* and *alparooksha* property is indicated in *kapha* predominant conditions. *Deepana* property helps to improve the functions of *agni*. *Acharya* specifically mentioned *Lāja* have the *medahara* and *kaphachida* property. So in dyslipidemia the above mentioning properties of *Lāja* were acting effectively.

The study results are significant in both groups. But in comparison to control group, the study group shows more result. This additional benefit may be due to the effect of *laja peya*. Reduction in lipid profile (total cholesterol, LDL, triglycerides, VLDL) after intervention may be due to the *deepana* property of *laja* and this *deepana* property may have increase the datwagni and thereby resulted in the normal transformation of *asthayi medodatu* to *sthayi medodhatu*. There is an association between physical activity and HDL cholesterol.[11] In this study both groups shows significant result in increasing HDL cholesterol but after comparison with control group the study group was not found to be significant.

The objective assessment was made on the lipid profile levels of the subject showed satisfactory improvements after treatment in both study and control group. But in the statistical analysis, Study group shows highly significant effect as compared with Control group except in HDL level.

This study has limitations. In this study borderline below range lipid profiles cases only included. It should be given as a diet above the range of borderline.

CONCLUSION

The study shows that *Lāja* was effective in reducing total cholesterol, LDL, triglycerides, and VLDL as because of its *lakhu ruksha guna, kapha hara and medachidah* property and there is not significant effect found in HDL cholesterol.

ACKNOWLEDGEMENTS

REFERENCES

1. Park K. Textbook of preventive and social medicine. 19th ed. M/s Banarasidas Bhanot Publishers, Jabalpur; 2007:332-336.
2. Gaziano TA, Bitton A, Anand S, Abrahams-Gessel S, Murphy A. Growing epidemic of coronary heart disease in low-and middle-income countries. Curr Probl Cardiol. 2010;35(2):72-115.
3. Expert Panel on Detection E. Executive summary of the third report of the National Cholesterol Education Program (NCEP) expert panel on detection, evaluation, and treatment of high blood cholesterol in adults (adult treatment panel III). Jama. 2001;285(19):2486-97.
4. M.Narayanan vaidyar . Charaka samhitha sutrastana. Redstar offset printers.Calicut. 2008; 241-243
5. Vidyasagar PS. Sharngadhara Samhita commentaries of Adhamalla's Dipika and Kasirama's Gudharthadipika. 4th ed. Chawkhambha orientalia, Varanasi;2000:95-100.
6. M. Narayanan vaidyar, Charakasamhithasutrastana, Redstar offset printers Calicut 2008, pg27/241
7. Prof. K.R. Srikanthamurthy, VagbhatasAshtangaHridayam Suthrasthana, 8thedition,Varanasi Choukambha Krishnadas Academy, 5/33-34, 2011, Page 61.
8. Awantika J, Mishra HS, Mridul R, Lal JM. Laja (Parched Paddy): A Neutraceutical in Debility. Ind J Anci Medi Yoga. 2015;2(5000).
9. Wankhede S, Jain S, Patrikar VG, Jakhar Y, Kamble N. Role of Pippalyadi dietary herbs in Dyslipidemia

as a risk reducer in cardio-vascular disease. J Ind SysMedi. 2017;5(1):48-51.

10. Surya KP, Lohith BA, Kumar MA. Emphasizing the role of amapachana effect of three forms of Laja (parched rice) manda along with panchakarma in the management of Amavata. Bull Env Pharmacol Life Sci. 2021;10:13-9.

11. Franczyk B, Gluba-Brzózka A, Ciałkowska-Rysz A, Ławiński J, Rysz J. The impact of aerobic exercise on HDL quantity and quality: a narrative review. Int J Molec Sci. 2023;24(5):4653.

Cite this article as: Renjumol VS, Sajeeshan AK, Sheela S. The effect of Laja in dyslipidemia: an interventional pre-post test. Int J Community Med Public Health 2024;11:1865-9.