

## Ancient Sources of Therapeutics

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### ABSTRACT

CHD tends to develop when cholesterol builds up on the artery walls, creating plaques. These plaques cause the arteries to narrow, reducing blood flow to the heart. Coronary Artery Disease is caused by plaque buildup in the walls of the arteries that supply blood to the heart (called coronary arteries) and other parts of the body. Plaque is made up of deposits of cholesterol and other substances in the artery. Plaque buildup causes the inside of the arteries to narrow over time, which could partially or totally block the blood flow. Coronary artery disease (CAD), when get worst, it is known as coronary artery syndrome (CAS). We compared Rosuvastatin 10 mg with Indian dates (Jujubes) as hypolipidemic agents. Their baseline parameters like LDL-cholesterol, HDL-cholesterol, systolic/diastolic blood pressure was determined in the hospital laboratory. It was observed that Rosuvastatin significantly decreased systolic/diastolic blood pressure, LDL-cholesterol, and increased HDL-cholesterol in 27 hyperlipidemic/hypertensive patients. Indian dates used in 30 hyperlipidemic patients significantly decreased systolic blood pressure, and LDL-cholesterol, but insignificant changes were seen in diastolic blood pressure, and HDL-cholesterol. We concluded from the research work that Rosuvastatin is potent hypolipidemic and hypotensive medicine as compared to indian dates.

**Keywords:** Pharmacology; Therapeutics; Coronary artery disease; Allopathic medications; Rosuvastatin

### INTRODUCTION

Coronary artery disease (CAD) causes impaired blood flow in the arteries that supply blood to the heart. Also called coronary heart disease (CHD), CAD is the most common form of heart disease and affects approximately 16.5 million Americans over the age of 20. It's also the leading cause of death for both men and women in the United States. It's estimated that every 40 seconds, someone in the United States has a heart attack [1]. A heart attack can come from uncontrolled CAD [1]. Great number of modern drugs are still derived from natural sources and 25 per cent of all prescriptions contain one or more active ingredients from plants. Researchers has estimated that 80 per cent of the population of developing countries still relies on medicinal plants for their primary health care needs and ensure patient safety by upgrading the skills and knowledge of traditional medicine providers [2-4]. Saponins and alkaloids present in indian dates (JUJUBES) fruit is directly associated with purifying the blood and eradicating harmful toxins from the body's systems. This antioxidant effect helps prevent a large number of disorders and diseases, like hyperlipidemia, hypertension, and hyperglycemia. And also indian dates ease the stress on the immune and lymphatic system and reduces blood pressure [5-9].

With a low calorie count and a higher protein and fiber level, indian date helps to satisfy nutritional needs and fill up, which

prevent from snacking in between meals [10]. Antioxidants help to neutralize free radicals, the dangerous byproducts of cellular respiration, which are liable for several chronic diseases and illness within the body [11,12]. The use of statin agents in patients with acute coronary syndromes (ACSs) remains an area of intense clinical interest [13]. Statin therapy has an established secondary preventive benefit in patients with coronary artery disease, and its extension to acute coronary syndrome seems logical [14]. A number of observational studies have shown an association between initiation of statin therapy early in acute coronary syndrome and improved clinical outcome. Four randomized controlled trials have examined the use of statin therapy for acute coronary syndrome: the Myocardial Ischemia Reduction with Aggressive Cholesterol Lowering study, the Pravastatin Turkish Trial, the Rosuvastatin on Risk Diminishing After Acute Myocardial Infarction study, and the Lipid-Coronary Artery Disease study.

Three of these trials showed a benefit with early initiation of statin therapy, whereas one trial demonstrated neither benefit nor harm [15]. To reversing the inhibitory effect of oxidized LDL on nitric oxide synthase-3, Rusuvastatin also have direct antioxidant effects on LDL in vitro and ex vivo. Metabolites of Rusuvastatin, but not the parent compound, inhibit oxidation of both LDL and very-low-density lipoprotein as well as high-density lipoprotein [16]. Metabolites, representing 70% of active Rusuvastatin in plasma,

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demonstrate free radical-scavenging abilities that may contribute to inhibition of lipoprotein oxidation [17]. Rosuvastatin also indirectly affect normal oxidative mechanisms by curbing the ability of macrophages to oxidize lipoproteins [18].

## SUBJECTS AND METHOD

The research was conducted at Ghurki Trust Teaching Hospital, Lahore-pakistan from January to June 2018. Sixty primary and secondary hyperlipidemic and hypertensive patients were selected from Ghurki Trust Teaching Hospital, Lahore, Pakistan. The research aim was to compare hypolipidemic and hypertensive effects of Rosuvastatin 10 mg and Ziziphus Jujubes (Indian dates) in these patients. Both male and female patients suffering from primary or secondary hyperlipidemia were selected. The age limit for patients was 20 to 70 years. Patients suffering from any major organ disease like liver, lungs, kidney, thyroid, heart and eye complications were excluded from the research. Written consent was taken from all participants. Baseline Lipid Profile was determined in Biochemistry lab of the Hospital. Serum cholesterol was estimated by enzymatic method using kit Cat. No: 303113050 by Eli Tech Diagnostic, France. Serum HDL-cholesterol was determined by using kit Cat No: 303210040 by Eli Tech Diagnostic, France. Chylomicrons, low density lipoprotein and very low density lipoprotein are specially precipitated with phosphotungstic acid and magnesium ions can then be removed by centrifugation, while high density lipoproteins remain in the supernatant. Cholesterol included in this phase is measured by an enzymatic method. LDL-cholesterol was calculated according to Friedwald formula [16] ie;  $LDL = TC - (TG/5 + HDL-C)$ . All Patients were divided in two groups, 30 patients in each group. Group-I was on Tablet Rosuvastatin 10 mg twice daily for two months. Group-II was on Jujube 500 grams daily in three divided times to eat. They were advised to take this fruit for two months. Mean values  $\pm$  SD were taken for statistical analysis. For parallel comparison, we used paired 't' test to get significance changes in tested parameters at start of treatment and at end of the research work. P-value  $>0.05$  was considered as non-significant change, p-value  $<0.01$  was considered as significant and p-value  $<0.001$  was considered as highly significant change in the tested parameter. We used SPSS version 2010 for statistical analysis.

## RESULTS

HMG-CoA reductase inhibitor (Rosuvastatin 10 mg) when used for two months in 27 hyperlipidemic patients, it reduced systolic blood pressure 30.1 mm of mercury and diastolic blood pressure

9.7 mm of mercury, LDL-C 29.2 mg/dl, and increased HDL-C 7.3 mg/dl. In group-II (n=30) which was advised to take Indian dates for two months, it reduced systolic blood pressure 10.9 mm of mercury, diastolic blood pressure 5.1 mm of mercury, LDL-C 7.9 mg/dl and increased HDL-C 3.3 mg/dl. Changes in all parameters are shown in Tables 1 and 2.

**SBP** means systolic blood pressure, **DBP** means diastolic blood pressure measured in mm of mercury, **LDL-C** means low density lipoprotein cholesterol, **HDL-C** means high density lipoprotein cholesterol measured in mg/dl. 'n' means sample size.

## DISCUSSION AND CONCLUSION

In our results two months therapy by Rosuvastatin 10 mg when used in 27 hyperlipidemic patients, it affected, when statistically analyzed, all tested parameters included systolic/diastolic blood pressure, LDL-cholesterol and HDL-cholesterol. Indian dates demonstrated no huge changes in 30 hyperlipidemic patients in their diastolic circulatory strain and HDL-cholesterol, however affected systolic pulse and LDL-cholesterol essentially, with p-values  $<0.01$ . Bihva et al. [19] explained same mechanism of action of Rosuvastatin as described in text books of medicines, pharmacology and therapeutics that it inhibits HMG-CoA reductase enzyme which is responsible to synthesize cholesterol in human body. They proved same effects of this drug on 56 hyperlipidemic patients. Cella et al. [20] proved 30.99 mg/dl reduction in LDL-cholesterol when they used Rosuvastatin 10 mg once daily for three months in 109 hyperlipidemic patients. Mekatal et al. [21] said in their conclusion that statins are the best among hypolipidemic agents used in patients suffering from primary or secondary hyperlipidemia. Ketylu et al. [22] accentuated to utilize Rosuvastatin in those patients who are defrauded by metabolic disorder with expanded oxidative pressure causing lethality in these patients because of myocardial dead tissue. Weight of free extreme development, diabetes, heftiness, hypertension, hypo or hyperthyroidism, over the top fiery responses in body, and usage of greasy nourishments may cause, rather cause coronary vein disorder which is hard to treat, however not feasible. Statins like Rosuvastatin is the best case of medications utilized in these patients [23]. Kakati et al. [24] have provided other options of treating patients suffering from hyperlipidemia, other than allopathic drug regimens. They recommended herbal medicines or medicinal plants to treat complicated cases of hyperlipidemia. They utilized Indian dates in 46 hyperlipidemic patients one kg every day for three days and demonstrated LDL-cholesterol decrease 8 mg/dl. No HDL-cholesterol increment was seen by them. Lomateevasel

**Table 1:** Group-I's (n=27) mean values  $\pm$  SD of all parameters tested, changes in parameters, and its statistical significance in change.

Parameter	At starting of treatment	After two months	Change in parameter	Statistical significance (p-value)
SBP	150.22 $\pm$ 1.11	120.11 $\pm$ 1.91	30.1	<0.001
DBP	97.91 $\pm$ 1.21	88.21 $\pm$ 1.11	9.7	<0.01
LDL-C	210.16 $\pm$ 2.11	180.97 $\pm$ 2.22	29.2	<0.001
HDL-C	37.91 $\pm$ 1.91	45.21 $\pm$ 2.19	7.3	<0.01

**Table 2:** Group-II's (n=30) mean values  $\pm$  SD of all parameters tested, changes in parameters, and its statistical significance in change.

Parameter	At starting of treatment	After two months	Change in parameter	Statistical significance (p-value)
SBP	141.71 $\pm$ 2.21	130.78 $\pm$ 1.11	10.9	<0.01
DBP	93.61 $\pm$ 2.00	88.54 $\pm$ 1.10	5.1	>0.05
LDL-C	198.82 $\pm$ 2.17	190.91 $\pm$ 1.73	7.9	<0.01
HDL-C	38.61 $\pm$ 2.19	41.91 $\pm$ 2.97	3.3	>0.05

et al. [25] demonstrated 20.6 mg/dl decrease in LDL-cholesterol when 400 grams indian dates were utilized in 22 hyperlipidemic patients for two months. They additionally demonstrated decrease in circulatory strain fundamentally in their patients. Circulatory strain huge impact isn't demonstrated in numerous investigations led on indian dates [26]. Terala et al. [27] demonstrated huge impacts of jujubes Z on all parameters of lipid profile and hypoglycemic impacts of this natural product when 250 grams of jujubes was utilized in 77 hyperlipidemic with hyperglycemic patients for the time of nine months. Olivo et al. [28] clarified in subtleties that correlation of allopathic medications with restorative herbs for treating hyperlipidemic patients ought to be sanely dissected on logical strategies/methods, which isn't ordinary pattern in eastern culture. Ethnicity is involved in utilization of these herbs leading to defame scientific research on various substances which are included in science as chemical compounds having medicinal/therapeutic potential.

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