

## A STUDY OF EFFECT OF GUGGULSTERONE ON HYPERLIPIDEMIA OF SECONDARY GLOMERULOPATHY

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( Received on November 18, 1993 )

**Abstract :** Hyperlipidemia in patients of secondary glomerulopathies, a well established entity with very little knowledge of its management modifies its prognosis by predisposing these patients to develop atherosclerosis, coronary artery disease, hypertension cerebro-vascular accidents and also thromboembolic phenomenon leading to renal vein thrombosis and renal failure. Guggulsterone was administered orally in these patients in a daily divided dose of 75 mg for a period of 8 weeks together with supportive measures like high protein diet, diuretics and hematinics. Total serum lipid, total serum cholesterol, triglycerides, phospholipids, HDL, LDL and VLDL were analysed at 4 and 8 weeks of therapy.

Significant reduction was observed in the values of total serum lipid and total serum cholesterol. Other parameters of lipid profile showed downward trend except rise of HDL with insignificant difference. There was no significant side effect throughout the study.

**Key words :** guggulsterone  
glomerulopathy

secondary  
hyperlipidemia

### INTRODUCTION

Secondary glomerulopathy is a common renal disorder encountered in practice of medicine, characterised by increased glomerular permeability and manifested by massive proteinuria (73.5 gm %/24 hours/1.73 m<sup>2</sup> surface area), hypoalbuminemia, lipiduria, hyperlipidemia with or without edema (1). Hyperlipidemia of secondary glomerulopathy with very little knowledge of its management modifies its prognosis even if treated adequately (2) by producing atherosclerosis, hypertension, coronary artery disease (3) and also cerebrovascular accidents, thromboembolic phenomenon, renal vein thrombosis leading to renal failure (4).

Guggulsterone, which is obtained from

oleoresin - Guggal of commiphora mukul (Burseraceae) has been shown to possess weight reducing and hypocholesterolemic activity in obesity, xanthomatosis (5, 6) and atherosclerotic (7) rendered animals. This lipid lowering and hypocholesterolemic activity of Guggul has been utilised with promising results in patients of hyperlipidemia of varied etiology like obesity (8, 9, 10), xanthomatosis (9) coronary artery disease (11), hypertension (9), peripheral vascular diseases (11) and cerebrovascular accident (9, 10, 11). Its efficacy as hypocholesterolemic agent is comparable to clofibrate (8, 9) and Ethyl-P-chlorophenoxyisobutyrate (11) and possess cardioprotective effect (8, 9) in patients of hypercholesterolemia and hyperlipidemia. Present study was undertaken to evaluate hypolipidemic effect

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of Guggulsterone in patients of secondary glomerulopathies.

### METHODS

The study population comprised of 50 subjects. Of these 25 age and sex matched subjects served as control. The study group included 25 patients of secondary glomerulopathy diagnosed according to the criteria of Brenner and Rector (12). They were admitted to medicine ward of J.N. Medical College, A.M.U. Aligarh from Feb. 1989 to May 1991. Sample of 4 ml venous blood was collected after overnightfast from both control and study group for the estimation of total serum lipid, total serum cholesterol, triglycerides, phospholipids, HDL, LDL and VLDL. The patients of secondary glomerulopathy were administered guggulsterone (Guglip-Cipla) orally in a daily divided dose of 75 mg for a period of 8 weeks alongwith supportive measures like high protein diet, diuretics and hematinics. Serum samples for lipid profiles were again collected and analysed at 4 and 8 weeks of therapy. Statistical analysis was done by using Student 't' test.

### RESULTS

Table I shows that distribution of subjects in study group according to age/sex and was comparable. Table II shows that all the parameters of lipid profile in the study group at the time of inclusion in the study were significantly higher ( $P < 0.05$ ) compared to control.

After 4 weeks of therapy with guggulsterone, all the parameters of lipid profile showed a downward trend except HDL although the values were not different significantly. At the completion of 8 weeks of therapy, reduction in values of all parameters of lipid profile continued but was statistically significant only with total serum lipid ( $P < 0.01$ ) and total serum cholesterol ( $P < 0.05$ ). HDL showed an insignificant rise throughout the study.

No significant side effects were observed except for mild diarrhoea in 3 patients and vague abdominal discomfort in two.

### DISCUSSION

The hypolipimic and hypocholesterolemic effects of crude guggul, its petroleum ether fraction A and a steroid isolated from its fraction are well established in a number of experimental trials using rabbits (5), chicks (6) and Indian domestic pigs (7) with no toxicity at its therapeutic doses. This therapeutic effect of guggul and its constituents has been utilised in the treatment of hyperlipidemia of obesity (8, 9, 10), xanthomatosis (9), hypertension, coronary artery disease (11) and cerebrovascular accident (9, 10, 11) with significant reduction in total serum lipid, total serum cholesterol and triglycerides. Its efficacy as hypocholesterolemic is comparable to clofibrate (8, 9) and chlorophenoxyisobutyrate (11) and possess cardioprotective effect in patients of hypercholesterolemia and hyperlipoproteinemia (8, 9) by altering HDL/LDL ratio.

TABLE I: Showing age/sex distribution in control and study group.

S.No.	Age group	Control group				Study group			
		Male		Female		Male		Female	
		No.	%	No.	%	No.	%	No.	%
1.	0-10 yrs	2	8	1	4	2	8	2	8
2.	11-20 yrs	5	20	3	12	6	24	2	8
3.	21-30 yrs	3	12	2	8	2	8	3	12
4.	> 30 yrs	8	32	1	4	7	28	1	4
	Total	18	72	7	28	17	68	8	32

TABLE II : Follow up of lipid profile of study group before and after guggulsterone therapy.

Parameters	Control@	Zero week*	P values @/*	After therapy			
				4 weeks **	P values */**	8 weeks ***	P values */***
Total serum lipid	376.60 ±82.89	872.04 ±201.77	< 0.001	785.40 ±200.75	NS	716.08 ±171.46	< 0.01
Total serum cholesterol	160.84 ±45.05	394.24 ±115.17	< 0.001	355.24 ±97.47	NS	320.88 ±90.53	< 0.05
Triglycerides	135.64 ±37.05	230.84 ±103.03	< 0.001	207.28 ±80.57	NS	189.44 ±91.63	NS
Phospholipids	128.80 ±34.87	319.22 ±76.61	< 0.001	295.64 ±78.36	NS	278.96 ±79.52	NS
HDL	40.96 ±9.95	54.16 ±24.21	< 0.05	59.36 ±22.90	NS	65.92 ±23.55	NS
LDL	71.68 ±38.63	215.92 ±89.33	< 0.001	196.40 ±82.87	NS	173.64 ±79.77	NS
VLDL	24.76 ±7.92	51.24 ±29.12	< 0.001	44.24 ±27.96	NS	37.32 ±24.10	NS

Values in mg % (mean ± S.D.)

NS - Non-significant.

In a statistical well planned, controlled clinical trial, using rigid criteria in 25 hyperlipidemic patients of secondary glomerulopathy, we have shown that guggulsterone significantly lower total serum lipid and total serum cholesterol at the completion of 8 weeks of therapy in patients of hyperlipidemia of secondary glomerulopathy. However, other parameters of lipid profile also showed downward trend except rise of HDL but with insignificant difference throughout the study.

The exact mechanism of hypolipimic action of the drug has not been worked out but its phytochemical analysis showed to possess an anion exchange property (5) thereby

sequestering bile acids in the intestinal lumen exchanging them with chloride for its faecal removal, similar to cholestyramine resin, an established therapeutic agent in patients of hypercholesterolemia (13).

It is concluded that guggulsterone is an effective hypolipidemic agent in patients of secondary glomerulopathy but requires further controlled trials of longer duration in higher doses to advocate its cardioprotective effect in these patients.

#### ACKNOWLEDGEMENTS

M/s Cipla Ltd. (INDIA) provided us the drug "Guglip" on gratis and their generous gesture is hereby gratefully acknowledged.

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