Effect of silymarin in diabetes mellitus patients with liver diseases

Sir,

The liver is involved in the maintenance of homeostasis within the body. Other functions of the liver include protein synthesis, storage and metabolism of fats and carbohydrates, detoxification and excretion of drug and other toxins.[1] Diabetes developed as a complication of cirrhosis is known as hepatogenous diabetes. Around 30–60% of cirrhotic patients suffer from this metabolic disorder.[2] There is a high prevalence of metabolic syndrome, obesity, and type 2 diabetes mellitus with cryptogenic cirrhosis.[3] Several reports have claimed a specific association between hepatitis C virus (HCV) infection and type 2 diabetes, but in most instances patients were a mixture of cases with cirrhosis, hepatitis and diabetes.[4] Silymarin is a hepatoprotective drug obtained from *Silibum marium*. Silymarin is reported to have different properties like hepatoprotective activity, anti-inflammatory activity, antioxidant activity, and anti-cancer activity.[5] Previous reports of both pre-clinical and clinical studies revealed that silymarin has got some anti-diabetic potential.[6-8] Considering all the above reports and keeping the evidences in mind, this study was undertaken with the objective to assess the effect of silymarin in diabetes mellitus patients with hepatic diseases.

The study was conducted on cirrhotic patients with diabetes

Table 1: Effect of silymarin and L-ornithine + L-aspartate on serum random blood glucose, bilirubin, SGOT, SGPT, ALP, albumin levels in patients with diabetes and hepatic disease

Treatment	Insulin + silymarin (200 mg/day; p.o.)		Insulin + L-ornithine + L-aspartate (150 mg/ day; p.o.)	
	Estimated values	Change %	Estimated values	Change %
Random blood glucose (mg/dl)				
Before treatment	215.6 ± 20	-	211.9 ± 30	-
After 3 months	202.1 ± 18**	-	189.1 ± 25***	-
After 5 months	197.2 ± 17.3***	8.26 ± 5.19	200.4 ± 23	6.06 ± 3.08
Bilirubin (mg/dl)				
Before treatment	2.5 ± 1.28	-	1.9 ± 0.59	-
After 3 months	2.0 ± 0.67	-	2.1 ± 0.53	-
After 5 months	1.4 ± 0.59**	39.65 ± 22.18	1.6 ± 0.37	8.93 ± 22.46$$
SGOT (U/l)				
Before treatment	126.2 ± 29	-	88.9 ± 32	-
After 3 months	106.9 ± 27***	-	76.8 ± 30	-
After 5 months	90.9 ± 30***	29.40 ± 9.28	75.3 ± 24*	11.38 ± 27.72
SGPT (U/l)				
Before treatment	85.6 ± 25	-	80 ± 19	-
After 3 months	68.7 ± 23***	-	72 ± 21*	-
After 5 months	54.9 ± 16***	35.56 ± 6.0	66.6 ± 18***	16.58 ± 10.80$$$
ALP (U/l)				
Before treatment	133.2 ± 32	-	136 ± 33	-
After 3 months	126.1 ± 35	-	128.5 ± 27	-
After 5 months	118.2 ± 34**	11.76 ± 8.47	116.4 ± 27**	13.32 ± 12.98
Albumin (g/dl)				
Before treatment	2.95 ± 0.48	-	2.35 ± 0.52	-
After 3 months	3.2 ± 0.25	-	2.68 ± 0.34	-
After 5 months	3.53 ± 0.27**	16.01 ± 15.06	3.151 ± 0.27***	25.39 ± 15.16

Values are expressed as mean ± SD; *n*=10. **P*<0.05, ***P*<0.01, ****P*<0.001 when compared to before treatment (one-way repeated measured ANOVA followed by Tukey multiple comparison test). Percentage change was calculated between "before treatment" and "after 5 months". $$*P*<0.01, $$$*P*<0.001 when compared to insulin + silymarin treated group (unpaired student *t*-test), SGOT: Serum glutamic oxaloacetic transaminase, SGPT: Serum glutamic pyruvic transaminase, ALP: Alkaline phosphatase

mellitus admitted to Medical Trust Hospital, Cochin, Kerala, during the period from July 2009 to December 2009. Patients of both gender, aged between 20 and 70 years, were included in this study. Pregnant females and patients with chronic pancreatitis were excluded from the study. Hepatitis B virus and HCV infected patients were also excluded from the study. The study was conducted after obtaining approval from Institutional Ethical Committee. We selected 10 patients with silymarin + insulin therapy and another 10 patients with insulin + (L-ornithine + L-aspartate). The effectiveness was determined by monitoring the random sugar levels, total bilirubin, serum glutamic oxaloacetic transaminase (SGOT), serum glutamic pyruvic transaminase (SGPT), alkaline phosphatase (ALP), serum albumin before treatment, and after 3 and 5 months of treatment.

Both insulin + silymarin treated group and insulin + (L-ornithine + L-aspartate) treated group showed reduction in random blood sugar level after 3 and 5 months of treatment when compared to before treatment, but no significant reduction was observed between the groups at different times of treatment. The percentage reduction in random blood sugar levels after 5 months of treatment with silymarin was found to be 8.26 ± 5.19% and in those taking L-ornithine + L-aspartate, it was 6.06 ± 3.08%. Our study also revealed that the decrease in the bilirubin, SGOT, SGPT and ALP levels after 5 months of treatment with silymarin were 39.65 ± 22.18%, 29.40 ± 9.28%, 35.56 ± 6.0%, 11.76 ± 8.47%, respectively, whereas with L-ornithine + L-aspartate treatment, the decrease in levels were 8.93 ± 22.46%, 11.38 ± 27.72%, 16.58 ± 10.80%, 13.32 ± 12.98, respectively. Silymarin produced significant reduction in bilirubin ($P<0.01$) and SGPT ($P<0.001$) levels after 5 months of treatment when compared to L-ornithine + L-aspartate. The percentage increase in the albumin levels with silymarin treatment was 16.01 ± 15.06% and with L-ornithine + L-aspartate was 25.39 ± 15.16% [Table 1]. The reduction in random blood glucose, SGOT and SGPT level produced by silymarin was consistent with the results of previous authors.[8,9] The hypoglycemic potential of silymarin may be due its antioxidant activity by reducing insulin resistance. Our study revealed that silymarin has good effect in the restoration of liver function and also established efficacy in controlling blood glucose level in diabetes patients with liver diseases. Silymarin may make a breakthrough as a new approach to protect other organs in addition to liver.

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