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EFFECT OF PHYNETOIN SODIUM ON LIVER FUNCTION TESTS

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ABSTRACT

Phenytoin sodium is the most commonly prescribed drug for the treatment of Grandmal epilepsy. The current study was conducted to evaluate the effect of Phenytoin sodium on liver function tests using serum AST, serum ALT, serum ALP as parameters. The results of the present study showed a significant increase in the levels of serum ALP in the epileptic patients on Phenytoin sodium as compared to control group. This increase in serum ALP could be a result of cholestasis induced by drug or as a consequence of hepatocellular toxicity.

KEYWORDS: **Phenytoin sodium, serum ALP, serum ALT, serum AST.**

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INTRODUCTION

Epilepsy is one of the common neurological disorder. Standard treatment provides control of seizures in more than 80% of patients. Effective prolonged and specific treatment of anti epileptic drug becomes absolutely essential for successful management. Phenytoin sodium is the most commonly prescribed drug for the treatment of Grandmal epilepsy. Studies from Bekele.G, Abebe.Y.T. and Haimanot R,[1] Aldenhovel-H.G.[2],[3]11 have shown increase in parameters which show decreased liver function and hepatic toxicity. But contradictory studies are also available. Elevation of AST and ALP are considered to be more specific markers of liver dysfunction than ALT.[4] So we conducted study to see effect of Phenytoin sodium on liver function using serum ASP, serum ALT, serum ALP as parameters in Wenlock Hospital.

MATERIALS AND METHODS

Thirty seven patients suffering from Grandmal epilepsy who attended the neurology O.P.D. of Wenlock Hospital were selected for study. The patients belonged to age group of 20 to 30 years. There were 20 males and 17 females, 25 patients were receiving 200 mg daily and 12 patients receiving 300 mg daily. The period of exposure to drug varied from one year to five years.

Ten healthy volunteers of same age group who were the control for the study. There were five males and five females.

10 ml blood was collected from each patient, 2 ml of serum was extracted from each sample, serum phenytoin level was measured using U.V. spectrophotometer, Bausch and Lamb 21 by the method of Dill.

5 ml of blood was collected to measure following biochemical parameters:

1. Serum Aspartate Transaminase.(AST)
2. Serum Alanine Transaminase.(ALT)
3. Serum Alkaline Phosphatase.(ALP)

RESULTS

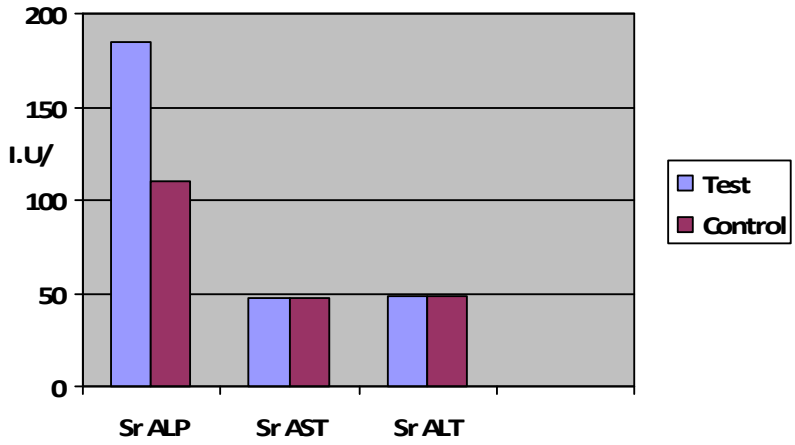
Serum phenytoin levels and biochemical parameters of liver enzyme levels of 37 epileptic patients are tabulated in Table-1 and Graph-1. Mean value of serum ALP in epileptic patients receiving Phenytoin sodium is 186.67 which is significantly higher than control group (106.3) $p < 0.001$.

TABLE 1

		Srum AST(I.U/L)	Serum ALT(I.U/L)	Serum ALP(I.U/L)
Patients with Phenytoin sodium	**Mean value of Epileptic patients.**	24.59	20.29	186.67
	S.D. of Epileptic patients.	8.87	10.34	78.11
Control group	**Mean value of control.**	23.5	18	106.3
	S.D. of control.	4.76	6.56	50.49
Comparison	**S.E.**	2.927	3.45	5.127
	T test.	0.37	0.66	15.62
	Probability (P).	>0.05	>0.05	<0.001

Serum ALP < 0.001 when compared with control highly significant.

GRAPH 1
Comparison of control and test levels



DISCUSSION

From the results of the present study we have arrived at the following finding of interest. Elevation of Serum Alkaline Phosphatase in the epileptic patients treated with Phenytoin sodium as compared to control group. This finding is highly significant. Studies from Bekkel et al[1], Aldenhovel et al[2],[3], Kazamatsuri et al[5], Wall et al[6] also showed elevated levels of Serum Alkaline Phosphatase in patients receiving phenytoin sodium therapy. Pooja et al[7] studies in childrens also showed raised serum ALP levels. This increase in Serum Alkaline Phosphatase could be a result of hepatocellular toxicity induced by phenytoin sodium[8]. In a similar comparative study by Callaghan N et al[9] and Berkovic et al[10] raised serum ALP levels were observed in patients on phenytoin suggesting hepatocellular dysfunction associated with anticonvulsant therapy. Further studies were needed to confirm hepatic toxicity of Phenytoin sodium like, histology of liver is required. From this study we recommend a regular watch on Liver function tests of the epileptic patients on Phenytoin sodium.

CONCLUSION

From the present study we come to the conclusion that long term Phenytoin sodium has a negative effect on hepatic function (Sr ALP levels) and further studies are required to find the exact mechanism of action.

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