



## An Observational Study of S-Adenosylmethionine (SAME) On The Patients of Non-Alcoholic Fatty Liver Disease

### KEYWORDS

S-adenosylmethionine (SAME), Non alcoholic fatty liver disease (NAFLD), Alanine transaminase (ALT), Aspartate aminotransferase (AST)

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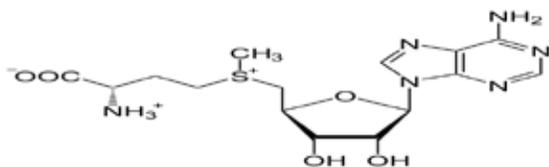
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**ABSTRACT INTRODUCTION :** S-adenosylmethionine (SAME) is a cosubstrate acts as a critical methyl donor and controls essential metabolic pathway by regulating several important enzymatic reactions. Most SAM-e is produced and consumed in the liver. Normal adult can produces 6-8 gms of SAME per day. In liver diseases, production of SAME is downregulated, that leads steatohepatitis, liver cirrhosis to hepatocellular carcinoma.

**METHODS:** In this study, 48 patients of NAFLD kept under observation for 6 wks. 36 patient, out of 48 patients, supplemented with S-adenosylmethionine(SAME) along with other therapies.

**RESULTS:** The group of patients, which was on SAME, have Transaminase level more closer to normal in comparison to other patients group after 6 wks of observation.

**CONCLUSION:** Clinical rational supplementation of SAME, as a therapeutic approach will reduce the morbidity and mortality associated with liver diseases.



### STRUCTURE OF S-ADENOSYLMETHIONINE

**INTRODUCTION:** Non alcoholic fatty liver disease (NAFLD) is the most common chronic liver disease worldwide and growing as an epidemic manner. The most common benign clinical presentation due to accumulation of triglycerides into the Hepatocytes (Hepatic steatosis), however the other extreme are cirrhosis with hepatocellular carcinoma. Once the NAFLD related cirrhosis develops, the annual incidence of primary liver cancer is 1%. The most common presentation in NAFLD is asymptomatic. Non alcoholic fatty liver disease patient has mildly elevated Transaminases, usually Alanine transaminase (ALT) level is greater than Aspartate aminotransferase (AST). Also patients generally co-associated with right upper quadrant pain, hepatomegaly, obesity, diabetes, dyslipidemia, and metabolic syndrome.

Abnormalities in hepatic transsulfuration, transmethylation on multiple steps, may lead to the development of fatty liver and the potential to sensitization to TNF-induced hepatotoxicity. Pathological study shows that, even before NAFLD is histologically apparent, the expression of hepatic SAME synthesizing enzyme MAT1a is significantly down regulated, so that, there is decreased mobilization of triglycerides(TG) stores, TG secretion in VLDL and phosphatidylcholine synthesis via phosphatidylethanolamine N- methyltransferase. Till date, there is not any approved therapies, regarding assessment of supplementation of SAME in the management of NAFLD.

S-Adenosyl methionine (SAME) is a common co-substrate involved in transmethyl, transsulfuration, and aminopropylation pathway. Most SAME is produced and consumed in the liver. More than 40 methyl transfers from SAM-e are known to support the synthesis and modification of cellular components like proteins, lipids, Glutathione (GSH) synthesis, DNA, and RNA. In this study we observed the effect of S-Adenosyl methionine (SAME) in adults with Non alcoholic fatty liver disease during hospitalisation period in J.L.N.M.C. Hospital, Bhagalpur. The effect of SAME is observed by rate of change in Liver Transaminases like, Alanine transaminases and Aspartate transaminase; ( ALT and AST).

**MATERIAL AND METHODS:** In this study, 48 persons were included, among them 36 were cases of NAFLD, and 12 normal control. Study was done at department of medicine, J. L. N. Medical College and Hospital, Bhagalpur, Bihar from August 2015 to September 2016. All the clinical examination, investigations and treatment were done at J. L. N. M. C. H. Bhagalpur. Only those patients whose diagnosis of NAFLD was confirmed, were included in this study. During study, 24 NAFLD patients, supplemented by 400mg t.i.d of S – Adenosyl methionine(SAME) for 6 weeks, whose ALT and AS T was elevated at the beginning of study.

**RESULTS:** Among the 36 NAFLD patients, 24 patients, received 1200mg of S-Adenosyl methionine(SAME) daily for 6 weeks, however the rest 12 patients had not received SAME. After 6 weeks of study, the patient who were on SAME, the levels of transaminases (ALT and AST) is more closer to normal level, in comparison to the NAFLD patients who was not on SAME. This rate of change in Transaminases is shown in table;

**Table 1:** Detection of ALT and AST in the plasma.

Groups	n	ALT (U l <sup>-1</sup> )	AST (U l <sup>-1</sup> )
Normal control	12	57.18 ± 1.99 <sup>a</sup>	215.56 ± 1.59 <sup>a</sup>
Model	12	157.62 ± 2.29	247.78 ± 1.93
Low-dose SAM	12	64.35 ± 1.62 <sup>a</sup>	189.39 ± 6.45 <sup>a</sup>
High-dose SAM	12	63.75 ± 2.85 <sup>a</sup>	187.50 ± 5.54 <sup>a</sup>

<sup>a</sup> Compared with model group, *P* < 0.01

ALT, alanine aminotransferase; AST, aspartate aminotransferase; SAM, S-adenosylmethionine.

This observational study shows that, patient on S-adenosyl-methionine had faster normalisation rate in Transaminases during liver NAFLD, in comparison to control group. So, S-adenosylmethionine can be used as an additional drug in NAFLD, which accelerates the recovery and shortens the hospitalization period.

**DISCUSSIONS:** Liver plays a vital role in SAME synthesis which occur via methionine metabolism. In a number of liver diseases, deficiencies of SAME are associated. So, clinical rational supplementation of SAME, as a therapeutic approach in a case of liver disease. As there is no pharmacological therapies approved by FDA to prevent or reverse the liver disease like steatohepatitis or cirrhosis. With regards to the therapeutic potential, SAME administration has been demonstrated as an effective hepatoprotective in liver diseases.

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