

Pharmacognosy and Medicinal Plants

CURATIVE EFFECT OF ARJUNOLIC ACID FROM TERMINALIA ARJUNA W. & ARN. ON CELLULAR AND RODENT MODELS OF NON-ALCOHOLIC FATTY LIVER DISEASE

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Statement of the Problem: The prevalence of NAFLD is estimated as 25.24% and it is increasing globally. NAFLD is a progressive disease leading to fibrosis, cirrhosis and carcinoma. Terminalia arjuna W. & Arn. (Combretaceae) is an endemic tree found in India and Sri Lanka and used traditionally for its cardioprotective and hepatoprotective effects. Arjunolic acid (AA) is a triterpenoid found majorly in the heart wood of *T. arjuna*.

Methodology & Theoretical Orientation: AA was isolated from the heart wood of *T. arjuna* by the method of King et al. The structure of AA was confirmed using spectroscopic studies. Steatosis was induced to Hep G2 cells using FFA mixture and the effect of AA on triglyceride accumulation and lipotoxicity were assessed. *In vivo* effect of AA on NAFLD was assessed using high fat diet fed rats.

Findings: The treatment with AA showed GI50 value of 746.34 μ M to Hep G2 cells. The treatment with AA significantly lowered the oil red O concentration by 26.44% and triglyceride accumulation by

58.96% at 100 μ M concentration. Fenofibrate treatment showed 29.15 and 57.56% reductions, respectively. The treatment with AA and fenofibrate showed 74.90 and 73.28% reduction in the leakage of LDH, compared to the vehicle treated group. The *in vivo* findings clearly demonstrated that the animals treated with AA at 50 and 100 mg/kg concentrations showed a significant decrease in the levels of transaminases, phosphatases and LDH levels. Further, the treatment increased the albumin to globulin ratio. The liver histology of the treated animals was normal (Figure 1). The treatment with AA, significantly upregulated the expression of genes viz., PPAR- α , FXR- α and CPT-1.

Conclusion: These evidences suggested that AA might be a promising lead to treat NAFLD. Future robust scientific studies on AA will shed more light on its usefulness for the treatment of NAFLD.

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