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Effects of retinoic acid on hepatocyte morphology and sinusoidal fenestrations in NAFLD rats

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Abstract

Objective This study aimed to evaluate the effects of retinoic acid (RA) treatment on hepatocytes and hepatic sinusoidal endothelial cells fenestrae and porosity in a non-alcoholic fatty liver disease (NAFLD) rat model. **Materials and Methods** Fifteen male Sprague Dawley rats were randomly divided into five groups (n=3 each): Group 1, control diet (CD); Group 2, CD with retinoic acid (RA); Group 3, high cholesterol diet (HCD); Group 4, HCD with vehicle; and Group 5, HCD with RA. The experiment duration was eight weeks. RA and vehicle were administered subcutaneously twice weekly during the last four weeks. Liver tissues were harvested and processed for scanning electron microscopy. Hepatocyte morphology was assessed descriptively. Fenestrae frequency and porosity of liver sinusoidal endothelial cells were quantified using ImageJ. Data were analysed with one-way ANOVA with Scheffé post hoc test. **Results and Discussion** Hepatocyte morphology was preserved in Groups 1 and 2, with polygonal cells and distinct borders. Groups 3, 4 and 5 showed swollen hepatocytes with

irregular borders. RA treatment in Group 5 partially preserved hepatocyte morphology compared with untreated HCD groups. Fenestra frequency was reduced in HCD-fed groups but did not differ significantly with CD groups. However, porosity was significantly lower in Groups 3, 4 and 5 compared with Groups 1 and 2 ($p < 0.05$). Although RA treatment partially improved hepatocyte morphology, it did not effectively reverse sinusoidal endothelial alterations. These findings indicate that RA alone may be insufficient to restore fenestration and porosity once endothelial capillarisation is established in NAFLD. Conclusion Retinoic acid showed some morphological preservation of hepatocytes but had no significant effect on restoring LSEC fenestrations or porosity. These findings highlight the limited structural impact of RA on hepatic microvasculature in NAFLD. ©The Ibn Sina Trust.

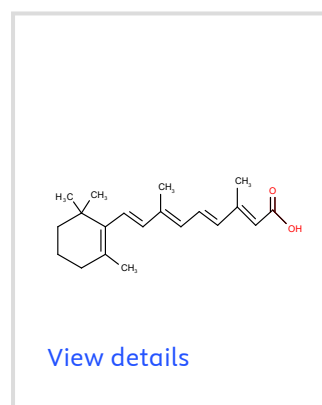
Author keywords

fenestration; non-alcoholic fatty liver disease; rat model; retinoic acid; sinusoidal endothelial cell

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