

Cinnamaldehyde Ameliorates Diabetic Nephropathy in Wistar Rats by Inhibiting AGEs-RAGE Inflammatory Pathways

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Introduction

- Diabetes mellitus (DM) is known for its multi-systemic toxicity but lacking molecular research in its contributory role in diabetic renal nephropathy.
- In this study, we have done molecular studies of DM to explore ameliorating effects of Cinnamaldehyde (CD) on AGEs-RAGE inflammatory pathway.

Objective

To explore the molecular mechanism of CD in DM – Streptozotocin induced type 2 diabetic nephropathy (DN) rats.



Methods

- Group 1: Control
- Group 2: DM
- Group 3: DM+CD
- Group 4: DM+AG

Results

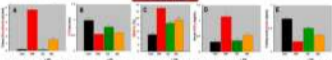


Fig. 1 Effect of CD on (A) renal histology, (B) Creatinine clearance, (C) Renal GFR, and (D) renal GFR in DM rats. Values are expressed as Mean \pm SEM and significantly different from DM+CD. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ vs. DM+CD (vs. DM+AG) respectively.

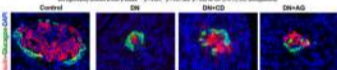


Fig. 2 Immunofluorescence comparison of glomeruli from Control, DN, DN+CD, and DN+AG groups. Stained with AGEs (red), RAGE (green), and DAPI (blue).

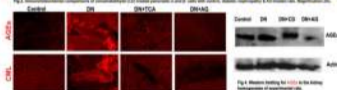


Fig. 3 Western blotting for AGEs in the kidney homogenates of experimental rats. Immunofluorescence comparison of glomeruli from Control, DN, DN+CD, and DN+AG groups. Stained with AGEs (red), RAGE (green), and DAPI (blue). Representative images. Western blotting analysis showing homogenates of AGEs and RAGE with β -tubulin as loading and entry control.

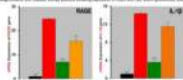


Fig. 4 Relative expression of RAGE (A) and L16 (B) in experimental rats kidney tissue homogenates. Values are expressed as Mean \pm SEM and significantly different from DM+CD. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ vs. DM+CD (vs. DM+AG) respectively.

Conclusion

- CD improves renal histology from diabetes and prevents AGEs protein cross-linking.
- CD decreases RAGE expression results in reduced AGEs-RAGE interaction and renal inflammatory pathway.

