



## Bioequivalence Evaluation of Lisinopril Trade vs Generic in Saudi Market using LC-MS

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### Introduction

Hypertension has become a global epidemic, with around 1.13 billion people being affected. <sup>(1)</sup> Uncontrolled hypertension is the leading cause of stroke, heart, and kidney failure if remained untreated and eventually can cause death in all ages. Angiotensin converting enzyme inhibitors (ACE) are one of the first line therapeutic agents that are used in the management of hypertension and Lisinopril is included in the class. Two drugs can be bioequivalent when they are equal in the rate and extent to which the active ingredient becomes available at the sites of drug action. Therefore, in this study the bioequivalence of lisinopril brand and generics available in Saudi market was evaluated. <sup>(2)</sup>

### Objectives

1. To validate and optimize LC-MS method of analysis for lisinopril in plasma.
2. To perform pharmacokinetic analysis for Lisinopril brand (Zestril) and generics (Lisino – Zenopril).
3. To evaluate the antihypertensive effect on animals and to assess the difference between Lisinopril brand and generics

### Methods

Twenty male albino rats with weight range (235-322g) received high salt diet daily for 14 days until hypertension was confirmed. <sup>(4)</sup> Animals were then divided into four groups (n=5) and each group received 5 mg once daily of either Lisinopril brand (Zestril) or generics (Zenopril or Lisino) daily for 14 days. The fourth group served as control. <sup>(5)</sup> Systolic blood pressure was then evaluated in day 2, 6, 9, 12 days. Liver and cardiac enzymes were also evaluated using ELISA kit.

### Results

After day 14 of treatments, systolic blood pressure for Lisino, Zenopril and Zestril, and control was plotted in figure (1) respectively. Liver enzymes AST and LDH was plotted in figure (2), (3) for Lisino, Zenopril and Zestril, and control respectively. Cardiac enzyme CK-MB was plotted in figure (4) for Lisino, Zenopril, Zestril, and control respectively.

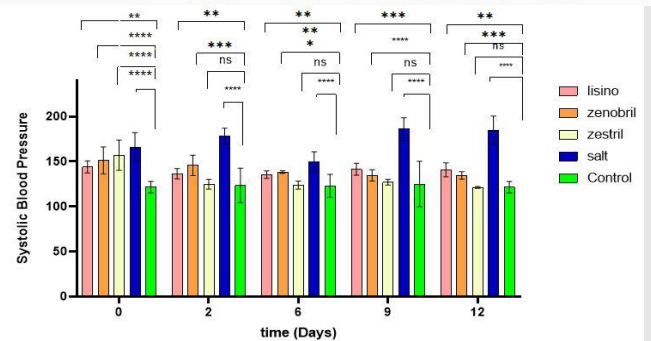


Figure (1): Difference in controlling SBP using Lisinopril brand and generics

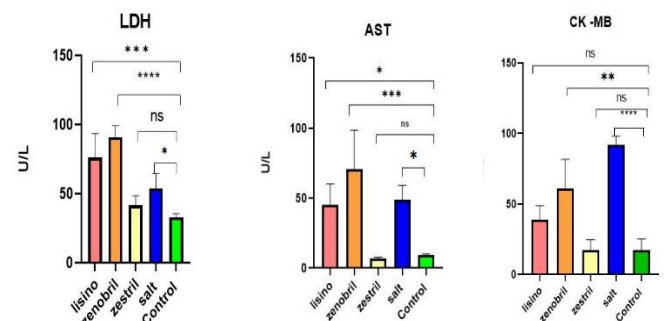


Figure (2), (3), (4): Effect of Lisinopril brand and generics on liver and cardiac enzymes respectively

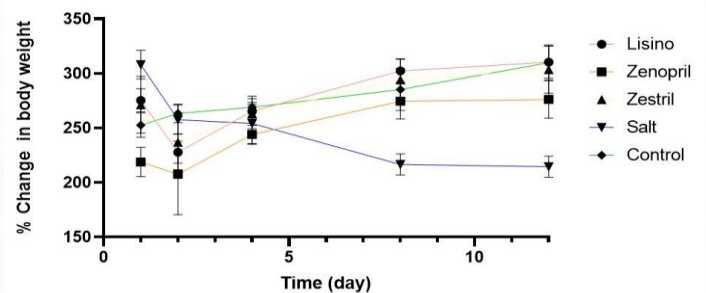


Figure (5): Effect of hypertension on animals' weight %

### Discussion and Conclusion

Zestril was more effective in reducing systolic blood pressure compared to generics Lisino and Zenopril apparent two weeks after treatment. Moreover, Zestril is safer on the kidney and heart in comparison to generics.

### References

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