

# Introduction

Turmeric, a golden spice long used in traditional medicine, has emerged as a focus in biomedical research due to its primary active compound, curcumin. Studies suggest that curcumin exhibits powerful anti-inflammatory, antioxidant, and anticancer properties, making it a potential therapeutic agent for a wide range of conditions. Despite promising preclinical findings, curcumin’s use in clinical medicine remains limited. This study critically examines the medicinal value and clinical relevance of curcumin based on peer-reviewed research.

# Methods

- Literature review conducted using the University of Washington database.
- Only peer-reviewed articles with impact factors ≥1.6 included.

# Results

## Antioxidant & Anti-inflammatory Effects

- Curcumin increases antioxidant enzymes and reduces free radicals, protecting cells from oxidative damage.
- It suppresses inflammatory enzymes and cytokines, reducing chronic inflammation.

## Anti-Cancer Properties

Curcumin induces apoptosis and inhibits tumor cell growth by blocking survival pathways (e.g., PI3K-Akt-mTOR).

## Kidney Transplant Study

Patients receiving curcumin had 71% early kidney function and 0 cases of graft rejection vs. 43% and 2 cases in the control group (Labban, 2014).

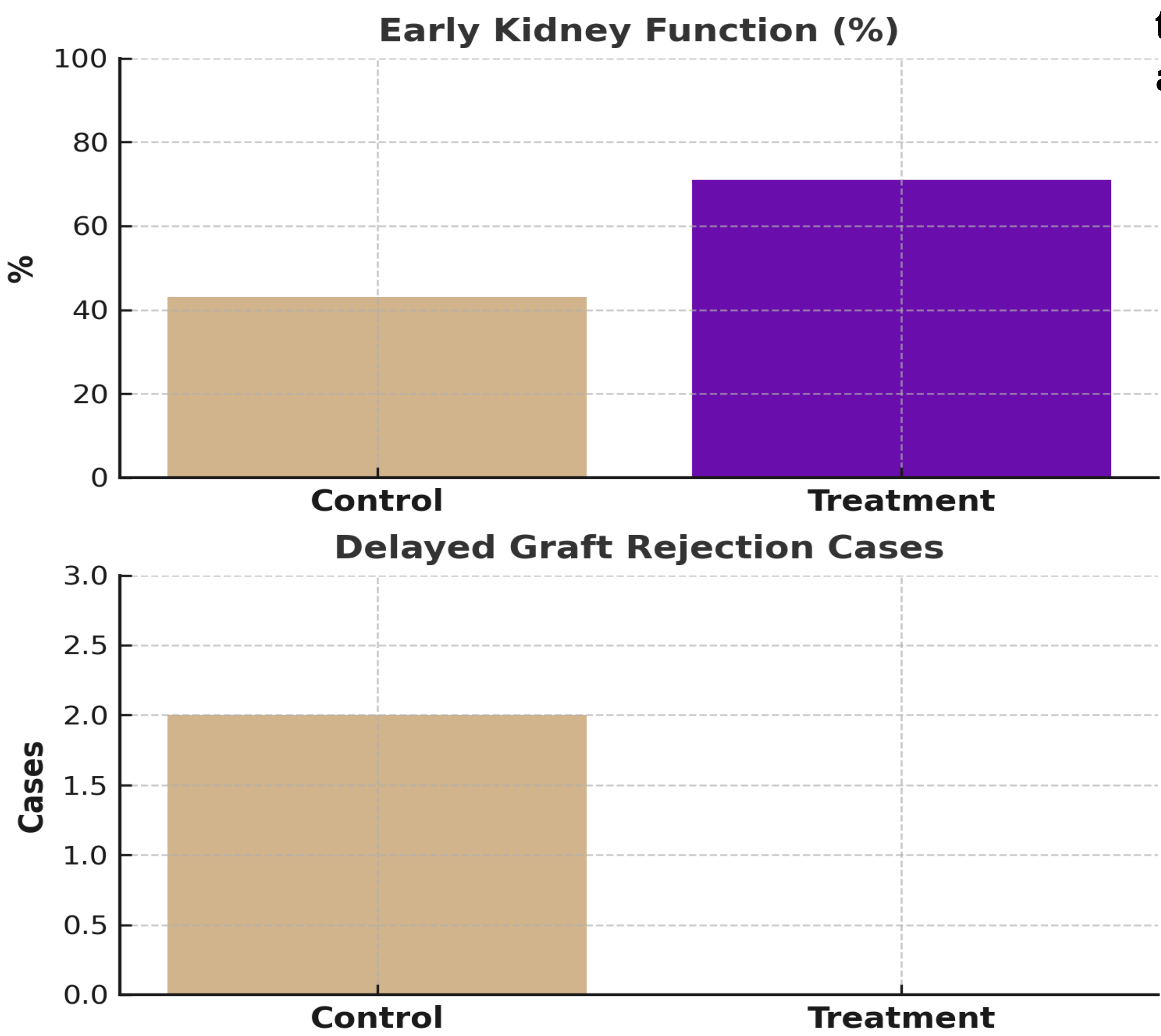


Figure 1 : Effects of Curcumin on Kidney Transplant Outcomes. Created using data from Labban (2014), this graph shows improved early kidney function and reduced graft rejection in patients treated with curcumin.

## Acknowledgements

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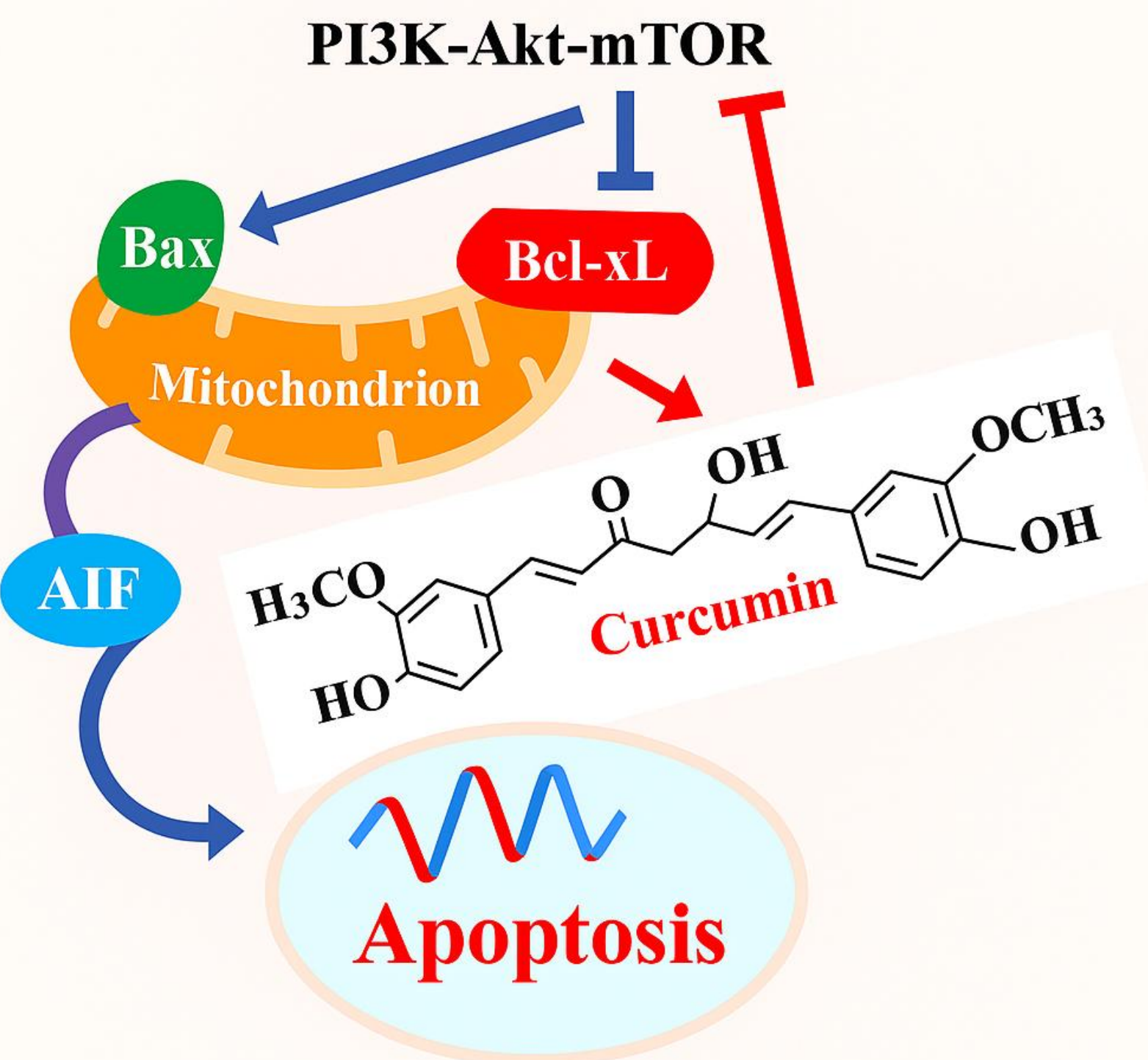


Figure 2: Curcumin-Induced Apoptosis in Cancer Cells. This schematic, adapted from Zhang et al. (2018), illustrates how curcumin promotes apoptosis by inhibiting the PI3K-Akt-mTOR pathway and activating mitochondrial and caspase-dependent mechanisms.

# Conclusion

- Curcumin is a powerful natural compound with promising therapeutic effects.
- Its antioxidant, anti-inflammatory, and anticancer properties are well-documented in preclinical studies.
- However, it is not yet clinically reliable due to bioavailability issues and lack of human trials.

# Future Directions

- Improve bioavailability.
- Large-scale human trials
- Investigate curcumin’s interactions with common medications in polypharmacy contexts.