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Potential Vasculoprotective Effect of Baicalein by Reducing Oxidative Stress and Inflammation in Abdominal Aortic Aneurysms Infused with Angiotensin II

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Introduction

Abdominal Aortic Aneurysms (AAAs) represent a significant cardiovascular health concern, characterized by the pathological dilation of the abdominal aorta. Left untreated, AAAs can lead to life-threatening complications, including rupture. Angiotensin II (Ang II), a hormone known for its role in blood pressure regulation, has been implicated in the development and progression of AAAs. This article explores the potential vasculoprotective effect of baicalein, a natural flavonoid, in the context of Ang II-infused abdominal aortic aneurysms. Specifically, we will delve into the mechanisms through which baicalein may reduce oxidative stress and inflammation, ultimately mitigating the progression of AAAs. Abdominal aortic aneurysms often develop silently, with patients remaining asymptomatic until a potentially catastrophic rupture occurs. Therefore, early detection and intervention are crucial. Ang II is a potent vasoconstrictor hormone that plays a significant role in the regulation of blood pressure and vascular tone. It also contributes to the pathogenesis of AAAs through mechanisms that involve oxidative stress and inflammation [1,2].

Description

Baicalein is a bioactive flavonoid derived from the roots of Scutellaria baicalensis, a traditional Chinese herb. It has gained attention for its antioxidant and anti-inflammatory properties. Baicalein has shown promise in promoting vascular health by reducing oxidative stress, inflammation, and endothelial dysfunction, making it a potential candidate for AAA treatment. The excess production of reactive oxygen species (ROS) in the aortic wall is a hallmark of AAAs. ROS can damage DNA, proteins, and lipids, further exacerbating vascular inflammation and weakening the aortic wall. Baicalein's potent antioxidant properties, including its ability to scavenge ROS and inhibit oxidative stress, may offer protection against AAA development and progression. Inflammatory processes, involving the release of pro-inflammatory cytokines and chemokines, contribute to the degradation of extracellular matrix proteins in the aortic wall. This results in aortic wall weakening and aneurysm expansion. Baicalein has demonstrated anti-inflammatory effects by inhibiting pro-inflammatory pathways, reducing cytokine production, and modulating immune responses [3,4]. These effects may help mitigate inflammation in the context of AAA. Baicalein can enhance the activity of SOD, an endogenous antioxidant enzyme. Nitric Oxide (NO) Preservation: Baicalein preserves NO, which is essential for vascular health. Inhibition of NF-κB: Baicalein inhibits the nuclear factor-kappa B (NF-κB) pathway, a key regulator of inflammation. Cytokine Modulation: Baicalein downregulates the production of pro-inflammatory cytokines like interleukin-6 (IL-6) and tumor necrosis factor-alpha (TNF-α). Adhesion Molecule Regulation: Baicalein reduces the expression of adhesion molecules that promote leukocyte infiltration into the aortic wall [5,6].

Conclusion

Abdominal aortic aneurysms present a substantial health risk, and their pathogenesis involves oxidative stress and inflammation, both of which are influenced by Ang II. Baicalein, a natural flavonoid, has demonstrated significant potential in mitigating these mechanisms, suggesting its role as a vasculoprotective agent in the context of Ang II-infused AAAs. As research continues, the clinical relevance of baicalein in AAA management may become increasingly evident, offering hope for improved outcomes and a safer future for those at risk of AAA development and progression.

Acknowledgement

None.

Conflict of Interest

None.

References

1. Kleczyński, Paweł, Artur Dziewierz, Marzena Daniec and Maciej Bagieński, et al. "Impact of post-dilatation on the reduction of paravalvular leak and mortality after transcatheter aortic valve implantation." *Kardiol Pol* 75 (2017): 742-748.
2. Nalluri, Nikhil, Varunsiri Atti, Abdullah B. Munir and Boutros Karam, et al. "Valve in valve transcatheter aortic valve implantation (ViV-TAVI) *vs.* redo-Surgical aortic valve replacement (redo-SAVR): A systematic review and meta-analysis." *J Interv Cardiol* 31 (2018): 661-671.
3. Al-Abcha, Abdullah, Yehia Saleh, Manel Boumegouas and Rohan Prasad, et al. "Meta-analysis of valve-in-valve transcatheter aortic valve implantation *vs.* redo-surgical aortic valve replacement in failed bioprosthetic aortic valve." *Am J Cardiol* 146 (2021): 74-81.
4. Pibarot, Philippe, Neil J. Weissman, William J. Stewart and Rebecca T. Hahn, et al. "Incidence and sequelae of prosthesis-patient mismatch in transcatheter *vs.* surgical valve replacement in high-risk patients with severe aortic stenosis: A partner trial cohort-A analysis." *J Am Coll Cardiol* 64 (2014): 1323-1334.
5. Musallam, Anees, Kyle D. Buchanan, Charan Yerasi and Aaphtaab Dheendsa, et al. "Impact of left ventricular outflow tract calcification on outcomes following transcatheter aortic valve replacement." *Cardiovasc Revasc Med* 35 (2022): 1-7.

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