



15. THE ROLE OF ESTROGENS IN CARDIOVASCULAR DISEASE

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Introduction. Epidemiological studies have shown that 17beta-estradiol (E2) levels are inversely associated with cardiovascular disease (CVD) events in post-menopausal women. This indicates that estrogens have a possible implication in CVD pathogenesis, through their genomic and non-genomic mechanisms of action.

Aim of study. Highlighting the role of estrogens and estrogen receptors in cardiovascular disease pathophysiology.

Methods and materials. Publications from the last 5 years, from specialized journals of the PubMed databases, were selected and analyzed using the following keywords: estrogen, estrogen receptors, genomic and non-genomic mechanisms, cardiovascular disease.

Results. Estrogens, through their specific receptors (ER α , ER β and GPR30s), displayed prominent effects on cardiovascular disease pathogenesis. Evidence suggests their role in the management of systemic and pulmonary arterial hypertension, protecting against atherogenesis, ischemia-reperfusion injury, and safeguarding against heart failure with either reduced or preserved ejection fraction (EF). The specific mechanisms of ER α include reducing sympathetic outflow and endothelial dysfunction, decreasing fibrosis and pulmonary vascular remodeling, preserving EF, and enhancing systolic function. ER β performs by decreasing vasoconstriction, vascular resistance and hypertrophy, mitigating fibrosis and inflammation, reducing apoptosis and preserving mitochondrial integrity, promoting cardiac angiogenesis and normalizing hemodynamic parameters. GPR30s mechanisms of action encompass relaxation of vascular smooth muscle, influence on nitric oxide synthesis, calcium level regulation, modulating cholesterol levels, and minimizing both inflammation and reactive oxygen species production.

Conclusion. Estrogens displayed a possible involvement in managing cardiovascular disease, by reducing both the progression and severity of numerous cardiovascular pathologies through various genomic and non-genomic mechanisms of action. Elucidation of cardio protective mechanisms, determined by estrogens and estrogen receptors, will contribute to the development of effective therapeutic strategies for CVD treatment.