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*Terminalia arjuna limits β-adrenergic receptors mediated cardiac hypertrophy *in vivo**

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Isoproterenol (ISO)-induced cardiac hypertrophy depends on a coordination of signaling through β 1and β 2-adrenergic receptors, involving several key cardiac remodelling pathways. The bark of Terminalia arjuna (TA) has been used for centuries in traditional medicine primarily as cardiotonic, but the cellular mechanisms for its cardioprotective effects remain undefined. The present study aims at evaluating the therapeutic potential of aqueous extract of TA in ISO-induced cardiac hypertrophy in male Wistar rats. TA effectively suppressed the expression of pathological cardiac hypertrophic markers like β -MHC, Sk α -Actin-1, Tgf- β 2 and BNP concurrent with the restoration of heart weight to body weight ratio near control level. 2-Dimensional Gel Electrophoresis of differentially regulated proteins followed MALDI-MS analysis led to the identification of range of structural, metabolic, cytoskeletal and scaffold proteins that were altered by ISO treatment and restored by TA extract. TA extract also inhibited the expression of sarcomeric genes like Myosin regulatory light chain2 (MrLC2), Myosin light chain3 (MLC3) and Tropomyosin α 1 chain and TroponinI which were significantly upregulated after ISO administration. Expression profile of several sarcomeric proteins viz; MHC, ELC, RLC, Actin, Titin, MyBPC etc.; key signaling kinases viz., pAKT, pERK, ER stress marker GRP78, and binding activity of several transcription factors viz., NFkB, GATA4, MEF2D, AP1, SP1, Nrf2 etc., associated with hypertrophic signaling were also regulated by TA. This study demonstrates aqueous extract of TA bark exerts cardio-protective effect on ISO-induced hypertrophied rat myocardium by modulating several key signaling molecules and gene regulatory pathways associated with β -adrenergic signaling.

Biography

Santosh Kumar has completed his M.Sc. (Biotechnology) from Lucknow University (2006), India and currently doing his Ph.D. from Jawaharlal Nehru University, New Delhi, India.

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