Triphala improves glucose and lipid homeostasis by targeting AMPK, inflammation and oxidative stress in human type 2 diabetes

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Aim/Hypothesis: Ayurvedic formulation "Triphala" had gained consideration as an anti diabetic medicine in the Indian pharmacopeia. Chronic hyperglycemia is often associated with oxidative stress. To address oxidative stress and the related aetiologies viz., dyslipidemia and inflammation, we enhanced the potent antioxidant component E. officinalis and validated this anti diabetic formulation Triphala-411 viz., (Emblica officinalis: Terminalia chebula: Terminalia bellarica::4:1:1).

Methods: Triphala-411 at a dose of 5 grams BD was administered orally for 12 months to human subjects with Type 2 diabetes, (n=20), Impaired glucose tolerance, IGT (n=10) and Normal glucose tolerance, NGT (n=10), based on their blood glucose levels and OGTT as recommended by WHO to assess its anti hyperglycemic, anti hyperlipidemic, anti oxidative and anti inflammatory potentials.

Results: Significant reduction in blood glucose and atherogenic lipids in Triphala-411 treated IGT as well as Type 2 diabetes subjects could be attributed to the enhanced expression of AMP activated protein kinase and decreased expression of protein kinase C. Anti-inflammatory potential as assessed through down regulation of Interleukin-6 and TNF-α, up regulation of Interleukin-10 gene; and antioxidative effect as assessed through significantly increased activity of antioxidant enzymes, reduction in lipid peroxidation, significant reduction in comet tail length and Sub-G1 phase of cell cycle exhibited resistance to stresses developed during progression of Type 2 diabetes. Triphala-411 therapy also addressed diabetic complications as evident from the down regulation of Aldose reductase and Poly- ADP ribose polymerase.

Conclusions: Triphala-411 proved itself as evidence based alternative anti-diabetic formulation owing to its anti-hyperglycemic, anti-hyperlipidemic, anti-oxidative and anti-inflammatory potential.

Biography

Nita Singh has completed her PhD in Biotechnology on identification of cellular target of Triphala with respect to its antidiabetic and antioxidative potential in human subjects with Type II diabetes at the age of 33 years from Department of biotechnology, Jiwaji University, Gwalior and; Pharmacology and toxicology, Defense research and development establishment, Gwalior, India. She is presently working on drug development against hepatocellular carcinoma from natural compounds using insilico approach in All India Institute of Medical Sciences, New Delhi, India. She has published more than 6 papers in peer reviewed journals.

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