Charlette Tiloke et al., Drug Des 2017, 6:3 (Suppl)
DOI: 10.4172/2169-0138-C1-014

Moringa oleifera aqueous leaf extract induces cell cycle arrest and apoptosis in human liver hepatocellular carcinoma cells

Charlette Tiloke[1,2], Alisa Phulukdaree[3], Robert M Gengan[2] and Anil A Chuturgoon[1]
[1]University of KwaZulu-Natal, South Africa
[2]Durban University of Technology, South Africa
[3]University of Pretoria, South Africa

Background & Aim: Hepatocellular carcinoma is one of the leading global epidemics with highest incidence in developing countries such as South Africa. Traditional herbal medicines have been utilized for generations and a medicinal tree, *Moringa oleifera* (MO), have been part of a variety of treatments including cancer. We investigated the anti-proliferative and apoptosis inducing effects of MO crude aqueous leaf extract (MOE) in human liver hepatocellular carcinoma ($HepG_2$) cells.

Methods: $HepG_2$ cell viability was evaluated using the MTT assay. Oxidative stress and DNA damage was determined using the TBARS and comet assays respectively. Apoptosis was assessed by caspase-9, -3/7 activities and ATP levels (luminometry). Cell cycle, γH2AX and cleaved PARP-1 were determined by flow cytometry. Protein expression of c-myc, Bax, p-Bcl2, Smac/DIABLO, Hsp70, SRp30a and cleaved PARP-1 was assessed using western blotting.

Results: $HepG_2$ cells were exposed to various concentrations of MOE for 24 h and an IC_{50} of 4.479 mg/ml was determined. MOE caused a significant increase in lipid peroxidation, DNA fragmentation and γH2AX levels. A significant decrease in G1, S and G_2-M phase was seen with a concomitant increase in apoptosis. SRp30a protein expression was significantly increased which led to the alternate splicing and subsequent activation of caspase-9. Caspase-9 and -3/7 was significantly increased with a significant decrease in ATP levels. Apoptosis was further confirmed with the significant decrease in c-myc, p-Bcl2 and Hsp70 protein expression and a significant increase in Bax, Smac/DIABLO and cleavage of PARP-1.

Conclusion: MOE induces cell cycle arrest, alternate splicing and apoptosis in cancerous $HepG_2$ cells.

Biography

Charlette Tiloke has completed her PhD at the Department of Medical Biochemistry at University of KwaZulu-Natal and is currently a Post-doctoral Research Fellow. Her research interests include anticancer and antimicrobial activity of medicinal plants and their synthesized nanoparticles.

charlettetiloke@gmail.com

Notes: