Korean Scutellaria Georgi flavonoid extract induces mitochondrially mediated apoptosis in human gastric cancer AGS cells

Gon Sup Kim[1], Venu Venkatarame Gowda Saralamma[1], Ho Jeong Lee[1], Gyeong Eun Hong[1], Hyeon Soo Park[1], Silvia Yumnam[1], Suchismita Raha[1], Won Sup Lee[2], Eun Hee Kim[3], Nak Ju Sung[1], Sang Joon Lee[4] and Jeong Doo Heo[4]

[1]Research Institute of Life science and College of Veterinary Medicine, Gyeongsang National University, Gazwa, Jinju, Republic of Korea,

[2]College of Medicine, Gyeongsang National University, Chilam, Jinju, Republic of Korea,

[3]Department of Nursing Science, International University of Korea, Jinju, Republic of Korea,

[4]Gyeongnam Department of Environment Toxicology and Chemistry, Gyeongnam Biological Resource Research Center, Korea Institute of Toxicology, Jinju, Republic of Korea

Objective/Purpose: In the present study, the anticancer effect of flavonoid extract from Korean S. baicalensis Georgi (FSB) was investigated with the aim of elucidating the underlying molecular mechanisms of the anticancer effect of FSB on AGS human gastric cancer cells.

Materials & Methods: The flavonoid compounds were extracted with 70% methanol from radix of Korean *Scutellaria bicalensis* Georgi (Jinju, Korea). We got the AGS cells from the Korea Cell Line Bank (Seoul, Korea). All experiments used that AGS cells were seeded into 6-well plates and stabilized for 24 h. The cells were then treated with or without *Scutellaria bicalensis*. Cells were cultured in RPMI1640 medium supplemented with 10% FBS, and 1% penicillin, streptomycin in a humidified atmosphere of 5% CO2 at 37°C. Cell viability was determined using MTT assay. Apoptotic cells were detected using a FITC annexin-V apoptosis detection kit 1 (BD Pharmingen, San Diego, CA, USA). And the levels of the apoptosis related proteins expression were analyzed by Western blot.

Results: Treatment of AGS cells with FSB significantly inhibited cell viability in a concentration-dependent manner. Furthermore, FSB significantly increased the proportion of cells in sub-G1 phase, and Annexin V and Hoechst 33258 fluorescent staining confirmed the apoptotic cell death. Furthermore, Western blotting results identified that treatment of AGS cells with FSB significantly downregulated the expression of caspase family members, namely procaspases 3 and 9, and poly (ADP-ribose) polymerase (PARP), and subsequently upregulated cleaved caspase 3 and cleaved PARP. It was observed that FSB treatment significantly decreased the mitochondrial membrane potential of AGS cells. In addition, the ratio of the mitochondrion-associated proteins B cell lymphoma 2-associated X protein and B cell lymphoma extra-large was upregulated.

Conclusion & Discussion: The results of the present study indicate that FSB significantly inhibits cell viability and induces apoptosis in AGS cells via the mitochondrially mediated intrinsic apoptotic signalling pathway. FSB-induced apoptosis was identified to be mediated by caspase activation and triggered by the modulation of Bcl-2 family proteins. To the best of our knowledge, the present study is the first to elucidate the underlying molecular mechanism for the anticancer activity of FSB in human gastric cancer AGS cells. Therefore, the present study provides novel insights into the biological effects of FSB, which may possess therapeutic potential for the treatment of human gastric cancer.

Biography

Gon Sup Kim has completed his PhD from Seoul National University and Postdoctoral Studies from University of Pennsylvania School of Veterinary Medicine. He is the Director of Korea National Animal Bio-resources Bank, Research Institute of Life Science and Professor of College of Veterinary Medicine, Gyeongsang National University South Korea.

gons6027@hanmail.net

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