Yu et al. BMC Complementary and Alternative Medicine 2012, 12(Suppl 1):P38
http://www.biomedcentral.com/1472-6882/12/S1/P38

BMC Complementary & Alternative Medicine

POSTER PRESENTATION Open Access

P01.38. Anti-cancer activity of extracts from Rauwolfia vomitoria and Pao Pereira

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From International Research Congress on Integrative Medicine and Health 2012
Portland, Oregon, USA. 15-18 May 2012

Purpose

To evaluate extracts from two medical plants Pao Pereira (Pao) and Rauwolfia vomitoria (Rau) for their anti-tumor effects in various types of pancreatic cancers and ovarian cancers.

Methods

Five pancreatic cancer and three ovarian cancer cell lines were tested that exhibited different resistance to the 1st line chemo-drug gemcitabine (Gem, for pancreatic cancer), and carboplatin (Cp, for ovarian cancer). Chou-Talalay's method was used to evaluate drug combination.

Results

Both Rau and Pao extracts induced dose-dependent cytotoxicities in all tested cancer cell lines, despite their inherent resistance to chemo-drugs. IC_{50} values for Rau were 140-350μg/ml, and 120-350μg/ml for Pao, depending on the cells tested. Normal epithelial cell MRC-5 was much less affected compared to all the tested cancer cells. The differences of cell viabilities between cancer cells and normal cells were statistically significant ($p<0.05$), indicating possible low toxicity of these extracts. To test whether the treatments of Rau or Pao could enhance the cells' sensitivities to chemo-drugs, we combined either Rau or Pao with gemcitabine to treat pancreatic cancer cells, and with carboplatin to treat ovarian cancer cells. The combination treatments took Chou-Talalay's constant ratio design, with molar ratio set to $IC_{50extract}$: $IC_{50Chemo}$. The combined-treatments significantly enhanced cell death in cancer cells which were strongly resistant to gemcitabine or carboplatin ($p<0.05$). The results showed a left-shift in the dose-response curves of the combination treatments compared to the corresponding curves with either Gem or Cp alone in all tested cancer cells. Combination indices (CIs) were <1, indicating synergistic effects.

Conclusion

These results pave the way for *in vivo* studies of the anti-cancer effects of Rauwolfia vomitoria and Pao Pereira extracts, especially in gemcitabine-resistant pancreatic cancers and carboplatin-resistant ovarian cancers. Studies on mechanisms of the anti-cancer actions are also undergoing concerning apoptosis and cell cycle arrests.

Published: 12 June 2012

doi:10.1186/1472-6882-12-S1-P38
Cite this article as: Yu *et al.*: P01.38. Anti-cancer activity of extracts from Rauwolfia vomitoria and Pao Pereira. *BMC Complementary and Alternative Medicine* 2012 **12**(Suppl 1):P38.

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