Cytotoxicity of newly synthesized Pd (II) complexes on Gastrointestinal Cancer Cell Lines(AGS, HepG2, and KEYSE-30)

Abstract

Purpose This study was undertaken to examine possible cytotoxic effect of three new Complexes, namely [(phen)Pd(μ-al-bis-dtc)Pd(phen)] $(NO_3)_2$(where alkylenebisdithio-carbamate, al-bis-dtc= propylenebisdi thi- ocarbamate (pn-bis-dtc, **1**); butylenebisdithio-carbamate (bu-bis-dtc, **2**); octylenebis- dithiocarbamate (oc-bis-dtc, **3**) and phen=1,10-phenanthroline) on Gastrointestinal (GI) cancer cell lines.

Methods Human gastric carcinoma (AGS), human hepatocellular carcinoma (HepG2), and human esophageal squamous cell carcinoma (KYSE-30) cancer cell lines were treated by different concentrations of three new Pd (II) complexes. Cytotoxicity was examined through MTT and clonogenic assays. Ethidium bromide/acridine orange (EB/AO) staining was used for apoptotic cell detection. A diamidino-2-phenylindole staining method was used to analysis cell cycle by flow cytometry.

Results In all case the IC50 values, obtained for AGS, HepG2, and KYSE-30 cell lines were much lower in comparison to cisplatin. Ethidium bromide/acridine orange staining demonstrated that three new Complexes apply its cytotoxic effect via apoptotic pathway. The mechanism for the inhibition was further investigated with cell cycle analysis. It hints that the three new Complexes are able to induce cytotoxic effect via cell cycle arrest at S and G2/M phase.

Conclusion Three new Complexes had cytotoxic effect on AGS, HepG2 and KYSE-30 cell lines but AGS cell line was more susceptible. The current study suggests that three new Complexes may induce cytotoxic effect on gastrointestinal cancer cell lines via apoptosis and cell cycle arrest.

Keywords New Palladium Complexes, Cisplatin, Apoptosis, Necrosis.