ABSTRACT

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Cancer is one of the leading causes of death worldwide. Epidemiological studies suggested that there is a low incidence of breast cancer in countries with high soya intake. Soya contains the isoflavones daidzein (D) and genistein (G), which are responsible for the protective properties, although their exact effects have not yet been clarified. In this study we evaluated and compared the biochemical and biological effects of a soya extract biotransformed by *Aspergillus Awamori* (SBE) and of the pure major isoflavones, G and D in placental microsomes and in an estrogen-dependent breast cancer cell line stably transfected with the aromatase gene, the MCF-7aro cell line. The results showed that D did not induce marked alterations in any of the parameters studied. In placental microsomes G was not a potent aromatase inhibitor, inducing only a moderate reduction in the aromatase activity. In MCF-7aro cells it was observed a significant decrease in cell viability, after 48 h treatment, with SBE, G and mixture of D and G in a dose-dependent manner. In addition, it was detected a decrease in cell proliferation evaluated by the thymidine assay. Morphological studies, using phase contrast microscopy, Giemsa and Hoechst staining, demonstrated the appearance of membrane blebbings and chromatin condensation, considered to be apoptotic features, as well as some vacuoles in the cytosol. By acridine orange staining these structures were identified as acidic vesicular organelles, a characteristic of autophagic cell death. In addition, while G induced cell cycle arrest in G_0/G_1 phase, SBE caused an arrest in G_2/M phase. This study demonstrated that G is a moderate aromatase inhibitor and induces cell cycle arrest and cell death. However, further studies are required to clarify if autophagy is associated to apoptosis and the mechanisms that underly G and extract effects on cell cycle progression.