Abstract

Introduction

Gastric cancer (GC) is defined as the primary epithelial malignancy derived from the stomach, and it is a complicated and heterogeneous disease with multiple risk factors. Despite its overall declining trend of incidence and mortality, GC still is considering as one of the leading causes of cancer-related death globally. Although GC treatment has improved significantly in the past decades, the overall patient survival rate is still not satisfactory mainly due to metastasis and drug resistance. Inhibition of proliferation, migration, and invasion of cancer cells is an important strategy for cancer treatment. Therefore, exploring new compounds that affect these processes could help us to find new therapeutic strategies to develop cancer treatment. carbonyl thiourea derivatives are important compounds in medicinal chemistry that have demonstrated their cytotoxic effect on cancer cells. The current study synthesized and characterized four new carbonyl thiourea compounds to evaluate their anti-migratory effects on human gastric cancer cells.

Materials and methods

four new N- (thiophene-2-carbonyl) thiourea derivatives were designed, synthesized and structurally identified by H-NMR, 13C-NMR, FT-IR, and MS spectra. in the next step, the cytotoxicity of the synthesized compounds was evaluated through the MTT test and their inhibitory effect on the migration of AGS cancer cells (gastric cancer cells) was investigated via wound healing assay.

Results

Cancer cells treated with compound R4 at concentrations of 50, 100 and 200 μg/ml with survival rate of 3.15%, 9.44% and 40.57% respectively and had a lower survival percentage than cells treated with other compounds, and this result indicates that compound R4 is more cytotoxic than the other three compounds. Compound R4 also exhibited superior wound-healing inhibition on the AGS cell line with regard to the control group at the intended doses. while the other derivatives led to wound-healing effect.

Discussion and conclusion

compound R4 with Cl substitution in the *para* position of the phenyl ring exhibited the greatest cytotoxic effect and also the greatest effect of inhibiting cell migration, which can be probably related to the This effect can be related to lipophilicity of this compound compared to the others and compound R4 can be introduced as a suitable model for further development of N-(thiophene-2-carbonyl)thiourea structures that inhibit cell migration in AGS cell line.

Key words

Gastric cancer, Cell migration, N-(thiophene-2-carbonyl)thiourea