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/ Type 2 Diabetes Mellitus (T2DM) in the Senior Patient

/ “Diabetes: Factos e Números 2014” – Preocupações

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Aniogenic properties of synthesized xanthones

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In the last years, natural prenylated and glycosylated flavonoids, galates, coumarins and xanthones have been emerging as promising anti-angiogenic agents. Nevertheless, divergent effects were noticed concerning hydrophobic and hydrophilic derivatives. In our research group, we have a library of xanthones with diverse activities, namely antitumor and antiplatelet, turning the study of the influence of these derivatives in the angiogenic processes opportune in the development of new anticancer or cardiovascular agents.

The aim of this work was to investigate the angiogenic effect of several synthesized xanthones with prenyl (XP13), epoxy (12EPOXI), glycosyl (XG and M) and sulfate (XGS and MS) substituents. Human umbilical vein endothelial cells (HVECs) were incubated with 0-500μM of 3,5,6-tris-O-β-glucopyranosyl)xanthone (XG), the natural product mangiferin (M) and their unsulfated derivatives XGS and MS, respectively. 3,4-dihydro-12-hydroxy-2,2-dimethyl-2H-pyran (XP13) and 12,12-dihydroxyxanthone (12EPOXI) for 24h. Cell viability was assessed using cell incubation with 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTS). The ability of cells to proliferate was evaluated using cellular incorporation of 5-bromo-2-deoxyuridine (BrdU). An injury assay was conducted to analyze the migration capacity of HVECs.

The angiogenic properties of the referred compounds were confirmed in vitro by the quantification of tubular structures formed by HVECs cultivated on matrigel. Quantifications are expressed as mean ± SEM and were evaluated by ANOVA followed by Bonferroni. A difference between experimental groups was considered significant whenever p ≤ 0.05. In general, HVEC viability decreased only 5-16% after exposure to the highest concentrations tested (500μM) of XG, XGS and MS. However above 100μM XP13 and 12EPOXI seemed to be toxic for HVECs, decreasing viability by 70 and 30%, respectively. HVEC proliferation decreased 30-43% for 500μM XG, XGS, M and MS, 69% for 100μM XP13 and 35% for 100μM 12EPOXI. With the exception of XG, that did not change migration capacity, 200μM XG, M, MS and 100μM XP13 and 12EPOXI decreased cell migration approximately by 50%. All compounds tested decreased formation of tubular-like structures on matrigel by 31-60% in tested concentrations being 12EPOXI the most potent, inhibiting the formation of these structures by 70%.

All tested compounds seem to manifest anti-angiogenic properties, affecting several steps of the angiogenic process. XG did not affect all studied steps. XP13 and 12EPOXI seem to be more effective at lower concentrations, however, care must be taken due to their toxic effects at higher concentrations. The anti-angiogenic properties of these xanthones deserve to be better studied, specially for the more water soluble compounds, as they may be interesting regarding therapeutic targets in pathologies where angiogenesis is deregulated.

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Handgrip strength cut-off values for undernutrition screening at hospital admission

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There is increasing evidence showing that handgrip strength (HGS) is an indicator of nutrition status [1,2] and a promising undernutrition screening tool [3]. However, HGS cut-off values for inpatients undernutrition screening remain to be studied. The present study aims to define gender and age-specific HGS cut-off values for undernutrition screening of hospitalized patients at admission. A cross-sectional study was conducted in a university hospital. Gender and age-specific receiver operating characteristic curves were constructed to evaluate the performance of HGS for correctly screening undernourished patients on the basis of their classification by Patient Generated Subjective Global Assessment. Sensitivity, specificity, areas under the curves (AUCs) and positive likelihood ratios (LRs) were calculated. The study sample was composed of 712 participants between the ages of 18-91 years old, median (interquartile range) of 58 (22) years. For women, HGS cut-off values, sensitivities and specificities were 18-44 years, 20.2 kgf, 0.741, 0.556; 45-64 years, 19.2 kgf, 0.795, 0.522. For men, these values were: 18-44 years, 41.7 kgf, 0.923, 0.520; 45-64 years, 37.9 kgf, 0.817, 0.402; >65 years, 30.2 kgf, 0.736, 0.567. The AUCs varied between 0.642 and 0.778 and LRs from 1.37 to 1.92. This study provides HGS cut-off values for men aged 18-91 years old and for women aged 18-64 years old.

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