

Gonadoliberin (GnRH) and its copper complex (Cu-GnRH) enzymatic degradation in hypothalamic and pituitary tissue *in vitro*.

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Streszczenie

The amount of decapeptide gonadoliberin (GnRH) that reaches pituitary gland depends not only on transcriptional, translational and posttranslational processes but also on the extent of degradation exerted by specific proteolytic enzymes. The copper-gonadoliberin (Cu-GnRH) complex preserves the native GnRH amino acid sequence but contains Cu(2+) ion bound to the nitrogen atom at the imidazole ring of the His(2). The aim of this study was to determine whether GnRH and Cu-GnRH molecules differ in their susceptibility to proteolysis in male rat hypothalamic and pituitary tissue *in vitro*. RIA was applied for a time-dependent study based on 0-90 min incubations at 30°C of exogenous peptide (2.5 µg GnRH or Cu-GnRH) in respective hypothalamic/pituitary supernatant and pellet fractions. To compare the protective effect of bacitracin, a competitive PEP inhibitor, incubations were made with (125 µg/sample) or without an inhibitor. In the second experiment 100 µg of GnRH or Cu-GnRH were incubated for 5 h at 37°C in hypothalamic and pituitary tissue *in vitro* and then HPLC analysis was applied both to characterize the elution pattern of GnRH and Cu-GnRH degradation products as well as to determine their AA composition. In both tissues, Cu-GnRH remained more resistant to enzymatic degradation and fully protected in the presence of bacitracin. In conclusion, the obtained data suggest that copper ion changed GnRH conformation and significantly modified its physiological properties due to a hindered endopeptidases access to specific AA bonds. Therefore, the Cu-GnRH complex might be considered as GnRH analog potentially able to prolong the occupation of a GnRH receptor at the gonadotrope cells.

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