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Meeting abstract

Characterization of receptors involved in serotonin contractions of isolated human umbilical artery in uncomplicated pregnancy

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Background

Serotonin (5-HT), is a vasoactive substance involved in physiological functioning of fetoplacental blood flow and continuous modulation of smooth muscle tone in umbilical vein and arteries. Since umbilical blood vessels have been shown to be deficient in autonomic innervation, the action of local autocrine vasoactive substances (including serotonin) is of considerable importance. Although seven main groups of 5-HT receptors (5-HT_{1-7}) have been characterized, it has been established that only several 5-HT receptor subtypes may be involved in vascular effects of this biogenic amine. Therefore, the aim of this study was to characterize receptors involved in serotonin-induced effect on isolated human umbilical artery (HUA) in uncomplicated pregnancy.

Methods

The experiments were performed on intact vascular rings of HUA isolated from umbilical cords that were obtained immediately after vaginal delivery in women with uncomplicated pregnancy. Only the remnant tissue, which would have been otherwise disposed of, has been utilized. Isometric tension of suspended artery rings was continuously recorded. Contraction induced by each concentration of 5-HT was later expressed as a percentage of the maximal contraction induced by Krebs bicarbonate solution with 60 mM KCl.

Results

5-HT (1 nM - 30 μM) produced concentration-dependent contractions of HUA. Control contractions produced by 5-HT were notably reduced by methiothepin (a nonselective 5-HT_1/5-HT_2 receptor antagonist; 0.01-1 μM), with typical irreversible competitive antagonism exposed. On the other hand, increasing concentrations of ketanserin (a selective 5-HT_{2A} receptor antagonist; 0.03-0.3 μM) significantly shifted 5-HT control curves to the right in a concentration-dependent manner with reversible competitive antagonism shown.

Conclusion

Schild's analysis of the effect produced by ketanserin, taken together with the results obtained with methiotepin, suggest that the transduction mechanism of HUA responses to serotonin in uncomplicated pregnancy involves activation of a mixed population of 5-HT_1 and 5-HT_{2A} receptors.

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