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JOURNAL ARTICLE

Endothelin-1 and its receptors in human testis

M. Maggi, T. Barni, C. Orlando, G. Fantoni, G. Finetti, G. B. Vannelli, R. Mancina, L. Gloria, L. Bonaccorsi, M. Yanagisawa and al. et

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We have previously found the presence of endothelin (ET) receptor and ET-like immunoreactivity in rat testis. We now extend our studies from rat to human testis. We found expression of a specific transcript for ET-1 and ET-1-like immunoreactivity in human testis. Positive staining was confined to the Sertoli cells of the tubular compartment, although few peritubular and interstitial cells were also stained. We also identified specific ETA and ETB receptor transcripts in human testis; ETA expression was more abundant than the ETB expression. Mathematical analysis of multiple self- and cross-competition studies among [125I]ET-1, [125I]ET-3, and analogues confirmed the presence of the ETA and ETB isoreceptors. In testicular homogenates, the ETA receptor was sevenfold more concentrated than the ETB receptor. In order to localize the receptors, we performed [125I]ET-1 autoradiography. Binding sites were mostly concentrated into the seminiferous tubules, although interstitial and peritubular myoid cells were also positive. Within the seminiferous tubules, [125I]ET-1 binding sites were confined to primary and secondary spermatocytes and early spermatids, whereas Sertoli cells were negative. We were unable to demonstrate the presence of functional ET receptors in ejaculated spermatozoa. Because ET-like immunoreactivity was present in Sertoli cells, we next asked whether authentic ET-1 is present in human seminal fluid and represents a good index for Sertoli cell function. Reverse-phase high-performance liquid chromatography analysis of ET-like immunoreactivity in seminal fluid indicated that most of the detected peptides correspond to the ET-1 precursor, big-ET-1. The seminal concentration of ET-like immunoreactivity was similar in normospermic, oligospermic, azoospermic, and vasectomized men, indicating that ETs are produced in different parts of the male genital tract and that they do not represent an useful tool for the diagnosis of male reproductive diseases. In conclusion, this study demonstrated, for the first time, the presence of ET-1 and its receptors in human testis.

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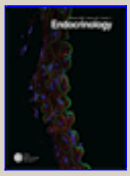

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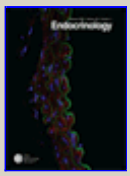

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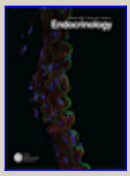

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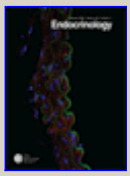

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