ROLE OF SOLUBILE GUANYLYL CYCLASE 11 (SGC11) ISOFORM IN MICE CORPUS CAVERNOSUM SMOOTH MUSCLE RELAXATION

Nimmegeers[1] S., Sips[1] P., Buys[1] E., Brouckaert[1] P., Van de Voorde[1] J.

[1]*Department of Physiology and Physiopathology and Department for Molecular Biomedical Research, Flanders Interuniversity Institute for Biotechnology (VIB), Ghent University, Ghent, Belgium johan.vandevoorde@UGent.be*

Aims:

Soluble guanylyl cyclase (sGC) is, as major effectors molecule for NO, an interesting therapeutic target for the treatment of erectile dysfunction. Therefore, we assessed the functional importance of the predominant soluble guanylyl cyclase (sGC) $\alpha_1\beta_1$ isoform in corpus cavernosum (CC) relaxation.

Methods:

CC isolated from male sGC$\alpha_1^{-/-}$ mice and wild type littermates were mounted in organ baths for measurement of agonist- or electrical field stimulation (EFS)-induced tension responses.

Results:

The endothelium-dependent relaxation to acetylcholine (ACh) or bradykinin (BK) and the neurogenic response to electrical field stimulation (EFS) were nearly abolished in the sGC$\alpha_1^{-/-}$ CC. The relaxing influence of exogenous NO (from sodium nitroprusside (SNP) and NO-gas) was also significantly decreased in the sGC$\alpha_1^{-/-}$ mice. The remaining relaxation seen in the sGC$\alpha_1^{/-}$ mice with exogenous NO, was strongly but not completely inhibited by the sGC-inhibitor ODQ. In the preparations of the sGC$\alpha_1^{-/-}$ mice, the response to BAY 41-2272 (NO-independent sGC-activator) and to T-1032 (phosphodiesterase type 5 inhibitor) were also significantly reduced. The specificity of the impairment of the sGC-related responses was demostrated by the similar forskolin (adenylyl cyclase activator)-and 8 pCPT-cGMP (cGMP-analogue)-induced responses.

Conclusion:

Our findings indicate the involvement of an sGC isoform with the α-subunit in NO-induced CC smooth muscle relaxation. However, the remaining relaxing influence of exogenous NO in the sGC$\alpha_1^{-/-}$ mice, suggests the contribution of (an) additional pathway(s).