INTRODUCTION & OBJECTIVE

Ejaculation consists in two distinct and successive phases i.e. emission and expulsion with the latter caused by rhythmic contractions of pelvic floor striated muscles; the primary role being played by bulbospongiosus (BS) muscles (Gerstenberg et al., 1998).

We have previously reported that the dopamine D2-like receptor agonist quinelorane delivered in cerebroventricle was capable to elicit rhythmic BS muscles contractions in anaesthetised rats (Clement et al., 2006; EAU 2006, poster #164). In addition it has been shown that the preferential D3 receptor agonist 7-OH-DPAT facilitated ejaculatory behaviour in male rats (Ahenius and Larsson, 1995).

The aim of the present study was to clarify the respective roles of D2 and D3 receptors in the control of the ejaculatory process in anaesthetised rats.

RESULTS

Methods:

Adult male Wistar rats weighing 200-250 g were anaesthetised with urethane (1.2 g/kg), tracheotomized, and the carotid artery catheterised for blood pressure measurement. All animal experiments were carried out in accordance with the European Community Council Directive (86/609/EEC) on the use of laboratory animals.

Intracerebroventricular cannula implantation

A cannula was stereotaxically placed into the cerebral ventricle (coordinates according to Paxinos & Watson rat brain atlas: 0.5 mm anterior to bregma, 1.3 mm lateral to midline, and 4.5 mm below the skull). Cannula was connected to an Hamilton syringe placed in a micropump allowing delivery of microvolume. At the end of the experimental session, methylene blue dye was injected through the cannula, and the brain, removed and grossly dissected, was inspected for the presence of blue dye in the ventricles.

Bulbospongiosus muscles electromyogram recording

Electrical activity of BS muscles was recorded by placing a pair of stainless steel electrodes (32 gauge) spaced 1-2 mm in the BS muscles. Electrical signal from the BS muscles was amplified (gain, 10000; Low pass, 10 KHz; High pass, 300 Hz) before being digitized.

Pharmacological stimulation of brain dopamine D3 receptors induced ejaculation in anaesthetised rats

Ejaculatory events were monitored using EMG recording of the BS muscles. A magnification of one cluster of contractions is displayed in the inset and allows to see the unitary events (i.e. bursts) of BS muscles cluster of contractions.

Table 2. Reversal of the effects of D3 (7-OH-DPAT) and D2 (TNPA) preferential agonists i.v. delivered on ejaculation and contractions of bulbospongiosus (BS) muscles in anaesthetised rats.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Dose (µg)</th>
<th>D3 agonist</th>
<th>D2 agonist</th>
<th>BS contractions</th>
<th>BS clusters</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-OH-DPAT</td>
<td>0.1 (+)</td>
<td>0.3</td>
<td>0.3</td>
<td>0.6</td>
<td>4.3 ± 0.3</td>
</tr>
<tr>
<td>Nafadotride</td>
<td>0.3 (+)</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>4.3 ± 0.3</td>
</tr>
<tr>
<td>TNPA</td>
<td>0.1 (+)</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>4.3 ± 0.3</td>
</tr>
<tr>
<td>Raclopride</td>
<td>0.1 (+)</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>4.3 ± 0.3</td>
</tr>
</tbody>
</table>

CONCLUSION

Both D3 (7-OH-DPAT) and D2 (TNPA) preferential agonists are capable to induce ejaculation in anaesthetised rats dose dependently.

7-OH-DPAT and TNPA pro-ejaculatory effects are very likely mediated by cerebral D3 receptors.

The results suggest the D3 receptor as a potential target for the treatment of ejaculatory dysfunctions, especially premature ejaculation, in humans.

References
