A comprehensive description of the neural circuitry controlling ejaculation is missing. We have performed in a series of studies, the first one allows us to bridge a gap in knowledge by integrating results obtained upon electrical stimulation (ES) of nerves involved in the control of the ejaculatory process, namely the spinal cord nerves of the penis (DSN) containing sensory afferents from genital and penile structures and the intermesenteric nerves (IMN), which contain most of the afferent and efferent fibers running in the hypogastric nerve (HN) to and from the pelvic viscera, including sexual accessory glands. This work was partly supported by a research grant from SANOFI-SYNTHELABO.

INTRODUCTION

Ejaculation consists in the succession of distinct physiological events:

- **Emission**: seminal vesicle (50-80%), prostate (15-30%), Cowper's gland
- **Expulsion**: bulbospongious and ischiocavernous EMG

The emission phase (secretion by seminal vesicles, prostate and ampulla ves deferentia) contains into the prostatic urethra of the different sperm components.

Forced expulsion of sperm to the urethral meatus is then caused by rhythmic contractions of pelvic and perineal striated muscles, with a primary role for the bulbospongious muscle.

METHODS

**Intact or acutely T8 spinalized isoflurane-anesthetized Wistar rats**

**Electrostimulation of peripheral nerves**: ES DSN + HN (1 ms, 6 V, 60 Hz for 30 s). The scale used for the representation of the EMG in B is not sufficient for accurate analysis of the EMG pattern during each expulsion reflex or plug emission. This schematic circuitry does not include spinal relays. We hypothesize that visceral afferences originating from the urinary bladder induce in the spinal cord an afferent volley reaching the sacral spinal cord (SSCE) by activating the motoneurons of the DS with ES of the IMN. This efferent volley reaches the bladder neck and activates the detrusor by integrating results obtained upon electrical stimulation (ES) of nerves involved in the control of the ejaculatory process, namely the spinal cord nerves of the penis (DSN) containing sensory afferents from genital and penile structures and the intermesenteric nerves (IMN), which contain most of the afferent and efferent fibers running in the hypogastric nerve (HN) to and from the pelvic viscera, including sexual accessory glands. Experiments were performed in intact and spinalized rats.

**RESULTS**

Stimulation of the input IMN always resulted in a consistent seminal vesicle contraction reaching an increase in seminal vesicle pressure (P). This response was often followed several seconds after the end of the ES by a strong activity of the bulbospongious muscle corresponding to an expulsion reflex or plug emission.

**DISCUSSION**

We have demonstrated that ejaculation could be induced in anesthetized rats by ES of the IMN. The results gained from this model supports that affections from the seminal trab are activated during the emission phase and participate to the triggering of the expulsion phase. It also suggests that emission is controlled exclusively by a supraspinal reflex. In contrast, expulsion appears to be controlled by two different reflexes, handled respectively at the spinal and supraspinal level.

**CONCLUSION**

After standard surgical preparation, the intermesenteric nerves (IMN) were exposed with the aid of a dissecting microscope and mounted on bipolar platinum electrodes connected to an electrical stimulator (AMS 2100, Physiop. France).

Five ES of the IMN on HN were performed every 15 min.

- **SVP** was recorded with a catheter inserted in one seminal vesicle tail and connected to a pressure transducer. The catheter was connected to a syringe pump with a tube, allowing simultaneous recording of SVP and perfusion of the seminal vesicle with saline to avoid clotting at the tip of the catheter.

- **Electromyographic recording** of the bulbospongious (BS) muscle was performed by placing two thin brass silver electrodes 1.2 mm apart into the muscle. Recorded signal was amplified (DP-301, Warner Instrument Corp., Physiop. gain, 10000. Low pass, 10 KHz; High pass, 10 Hz) before being digitized.

The emission phase (secretion by seminal vesicles, prostate and ampulla ves deferentia) contains into the prostatic urethra of the different sperm components. Forced expulsion of sperm to the urethral meatus is then caused by rhythmic contractions of pelvic and perineal striated muscles, with a primary role for the bulbospongious muscle.