

LETTER

The psycho-sensory pelvic reflex: A new paradigm in the model of male sexual response

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To the Editor,

What are the male anatomical structures that trigger the so-called "desire" to have sex? What are the male anatomical structures that determine the perception of arousal in men?

The most prevalent models of male sexuality to date, those of *Masters W, Johnson VE* (1) and *Kaplan HS* (2), while revolutionary for their time and introducing important physiological concepts, begin the entire process with erection and its perception as the first anatomical sign of male arousal and desire. However, erection as the first response of male reactivity does not always coincide with arousal, understood as the psychological and physiological arousal that a male experiences in response to sexual stimuli. It also does not always coincide with the perception of arousal, meaning the perception of occurrence of an erection, or more accurately, the excitatory response of the genitals.

In fact, the subjective perception of the excitatory response of the genitals does not always correspond simultaneously with the actual genital response, such as an increase in penile volume and rigidity (3, 4). For instance, a study by *Rieger* (5) reported that some men without erectile dysfunction, when asked to perform mathematical calculations during visual erotic stimulation, experienced a reduction in erection but not in self-reported arousal. In other situations, the opposite was found: a genital excitatory response, such as an erection, occurred without a subjective state of arousal. This is what happens during nocturnal erections in the REM phase of sleep, which are not always associated with erotic dreams or arousal states (6, 7).

Another example where erection does not lead to subjective arousal and its perception is the phenomenon of priapism, which is characterized by an erection without arousal (8). The same phenomenon can be observed during cavernous pharmacological infusion with papaverine, as occurred during *Virag's* experiment, in which an erection was obtained under general anesthesia without the subject being aroused or aware of it (9).

This lack of simultaneous correspondence, at least in men, may be due to the fact that the perception of the genital response after visual or psycho-sensory stimulation may not be a simple perception of erection, but rather a consequence of the involvement of another structure, which, according to my hypothesis, is the pelvic floor.

There are three clues that have led me to hypothesize that the first response to psycho-sensory stimulation, understood as all visual or mental erotic stimuli, could involve an initial response mediated through pelvic floor contraction, making the male subject aware of the genital excitatory response.

The first clue arises from the negative consequences on sexuality following radical prostatectomy for cancer. This "experimental model", which I place in quotation marks out of respect for the patients who have undergone cancer surgery, highlights two phenomena that have so far only been described as contemporaneous but not yet proven to be in a cause-and-effect relationship: damage to the pelvic floor (10) with static alterations due to vesicourethral anastomosis (11) and a decrease in libido by 50% (12), even when erection is restored postoperatively (13).

The second clue that supports my hypothesis is based on studies by *Shafik* published in 2001 (14), in which the author demonstrated that both the bladder and rectum exhibit an excitatory reflex involving the levator ani muscle and an inhibitory reflex involving the pubo-rectalis muscle, which regulates the perception of urgency and the mechanism of evacuation and urination. This study raises the question: if the bladder, rectum, and penis share common nerve bundles and blood vessels, and if these structures are all traversed by the pelvic floor muscles, why should these same muscles not play a similar role in male arousal, not just in erection and ejaculation, as has been demonstrated so far? (15-17).

The third piece of evidence for this new theory on male sexual response is based on research conducted by *La Pera* (18) and colleagues, in which 270 subjects, responding to a questionnaire that evoked an erotic image, highlighted a correlation between initial arousal and pelvic floor contraction.

The purpose of this work is to propose a new pathophysiology of the male sexual response, integrating the model of *Masters*

and *Johnson*, which includes excitement, plateau, orgasm, and resolution. In this new hypothesis, their model is complemented by a fifth step represented by the psycho-sensory pelvic reflex, mediated by the contraction of the pelvic floor.

Pathophysiology of the male sexual response

To illustrate the proposal of this new model, which integrates the pioneering work of Masters and Johnson, we analyze two aspects that have not been considered until now and which, in our opinion, although not yet demonstrated, could be fundamental to the first male sexual response: the psycho-sensory sexual reflex and the perception of the male genital response.

The psycho-sensory sexual pelvic reflex

The hypothesis proposed here is based on the reflexive involvement of the pelvic floor in response to psycho-sensory erotic stimulation. This reflex response, in my view, consists in the contraction of the pelvic floor, which makes the subject aware of the excitatory response. According to this new model, when a man receives visual or imagined erotic stimulation, a reflexive contraction of the pelvic floor occurs. This reflex not only causes the contraction of the levator ani muscle, but also triggers the contraction of the bulbourethral, bulbocavernosus, and ischiocavernosus muscles.

In this proposal, following psycho-sensory stimulation, the contraction of these muscles results in the compression of the intra-abdominal part of the penis, increasing the pressure within the corpus spongiosum and corpus cavernosum. Furthermore, this increase in pressure within the corpus spongiosum of the urethra is transmitted to the glans and its receptors, resulting in the perception of the genital response. According to this hypothesis, the psychophysiological reflex is the missing link – the mechanism – in the sequence of events that leads from visual or imagined erotic stimulation to a genital response and its perception.

The perception of the male genital response

If the sequence of events is as described above, we should ask ourselves how the perception of the sensation of the first genital excitatory response occurs and how we should define this initial genital excitatory response.

Continuing with this hypothesis, the perception of this genital excitatory response – the process through which we interpret, organize, and give meaning to the sensations originating from the genitals – occurs because the pelvic floor muscles, including the bulbourethral, bulbocavernosus, and ischiocavernosus muscles, reflexively contract in response to a psycho-sensory stimulus, causing a “*compression*” of the internal part of the penis, consisting of the corpus cavernosum and the corpus spongiosum of the urethra. The contraction of these muscles increases pressure within the penis, corpus cavernosum and corpus spongiosum of the urethra, and is transmitted to the receptors of the glans. This contraction and increase in pressure inside the penis determine the perception of the genital response.

From this psycho-physiological mechanism, we can deduce how to define the first genital excitatory response, which should therefore be defined as the contraction of the pelvic floor muscles and increase in pressure within the corpus cavernosum and corpus spongiosum of the urethra in response to psycho-sensory erotic stimulation.

DISCUSSION

Once the perception of the contraction of the pelvic floor and increase in pressure within the corpus cavernosum and corpus spongiosum of the urethra becomes conscious, there is a need to engage in sex and seek mechanical genital stimulation that leads to orgasm.

This need constitutes an “*Ejaculatory urgency*”, similar to the sensation experienced when the bladder is full and there is an urgency to find an appropriate place to void the bladder and relieve the sensation of urgency. The antagonist of this psycho-sensory sexual pelvic reflex could be the pubo-rectalis muscle, which, similar to how it inhibits contraction for urination and defecation, inhibits the sensation of urgency to evacuate (14).

When such a “*need*” becomes conscious through this sensation, the brain decides case-by-case how to proceed to find a solution to satisfy this need, using the tools at its disposal.

The contraction of the pelvic floor, generating the sensation of genital response, would signal the need to “*take action*” and engage in behaviors that enable mechanical stimulation of the genitals – in other words, to have sex. The perception of the contraction of the pelvic floor and the increase in pressure within the corpus cavernosum and corpus spongiosum initiates a series of behaviors aimed at achieving mechanical stimulation of the genitals that lead to ejaculation. This is a “*cascade*” of events that begins with the psycho-sensory pelvic reflex and ends with ejaculation. The perception of this contraction, due to the psycho-sensory pelvic reflex, as reconstructed here, could be one of the triggers or one of the possible motivations that initiates the search for sexual activity.

The new five-phase model of male sexual response

The sequence of events describing the new model of the male sexual response consists of five phases. At present, it is not known how much each of these phases may overlap with the previous one and continue subsequently after the end of its action. According to this proposal, the classic Masters and Johnson model is supplemented by a preliminary phase called the phase of reflex and perception.

Phase of the psycho-sensory sexual pelvic reflex and its perception

The phase of reflex and perception that precedes the four stages of the male sexual response described by *Masters and Johnson* consists of the following six moments:

1. *Trigger phase*: The subject has a thought or sees an erotic image capable of eliciting a genital excitatory response.
2. *Phase of the psycho-sensory pelvic reflex*: In this phase, the erotic stimulus triggers a neurological reflex that leads to an involuntary contraction of the pelvic floor, particularly the levator ani, bulbourethral, bulbocavernosus, and ischiocavernosus muscles.
3. *Compression phase*: The intra-abdominal part of the penis and urethra, where the bulbourethral, bulbocavernosus, and ischiocavernosus muscles insert, are compressed by the contraction of these muscles.
4. *Pressure increase phase*: Following the compression in the previous phase, an increase in pressure occurs within the corpus cavernosum and corpus spongiosum.
5. *Perception phase*: The increase in pressure in the corpus cavernosum and corpus spongiosum of the urethra, the stimulation of the receptors of the glans, and the contraction of the pelvic floor are consciously perceived.
6. *Trigger phase*: Once it is perceived that a genital response has occurred, the subject begins to feel the need to have sex and engages in behaviors aimed at achieving the mechanical stimulation necessary for a full erection, to then progress to the plateau phase, and subsequently to orgasm with ejaculation.

CONCLUSIONS

In this article, a new paradigm for the male sexual response is proposed and hypothesized, integrating a fifth step into the *Masters and Johnson* model. This new model consists of the psycho-sensory sexual pelvic reflex and perception of pelvic floor contraction, which triggers the “*cascade*” of the subsequent four phases of the male sexual response: excitement, plateau, orgasm, and resolution. In this model, the subjective perception of pelvic floor contraction could be the trigger that initiates the motivation to seek mechanical genital stimulation to achieve ejaculation.

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Conflict of interest: The authors declare no potential conflict of interest.