

The Effect of Condoms on Penile Vibrotactile Sensitivity Thresholds in Young, Heterosexual Men

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ABSTRACT

Introduction. Investigating the ways in which barrier methods such as condoms may affect penile sensory thresholds has potential relevance to the development of interventions in men who experience negative effects of condoms on sexual response and sensation. A quantitative, psychophysiological investigation examining the degree to which sensations are altered by condoms has, to date, not been conducted.

Aim. The objective of this study was to examine penile vibrotactile sensitivity thresholds in both flaccid and erect penises with and without a condom while comparing men who do and those who do not report condom-associated erection problems (CAEP).

Methods. Penile vibrotactile sensitivity thresholds were assessed among a total of 141 young, heterosexual men using biothesiometry. An incremental two-step staircase method was used and repeated three times for each of four conditions. Intra-class correlation coefficients (ICCs) were calculated for all vibratory assessments. Penile vibratory thresholds were compared using a mixed-model analysis of variance.

Main Outcome Measures. Penile vibrotactile sensitivity thresholds with and without a condom, erectile function measured by International Index of Erectile Function Questionnaire, and self-reported degree of erection.

Results. Significant main effects of condoms (yes/no) and erection (yes/no) were found. No main or interaction effects of CAEP were found. Condoms were associated with higher penile vibrotactile sensitivity thresholds ($F[1,124] = 17.11, P < 0.001$). Penile vibrotactile thresholds were higher with an erect penis than with a flaccid penis ($F[1,124] = 4.21, P = 0.042$).

Conclusion. The current study demonstrates the feasibility of measuring penile vibratory thresholds with and without a condom in both erect and flaccid experimental conditions. As might be expected, condoms increased penile vibrotactile sensitivity thresholds. Interestingly, erections were associated with the highest thresholds. Thus, this study was the first to document that erect penises are less sensitive to vibrotactile stimulation than flaccid penises.

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Key Words. Young Men; Penile Sensory Thresholds; Penile Vibratory Thresholds; Penile Biothesiometry; Condoms; Male Sexual Health

Introduction

Penile sensation and tactile stimulation play an important role in male sexual response and function [1,2]. Studies have explored the relevance of penile sensitivity to erectile functioning in men with diabetes, premature ejaculation, and erectile dysfunction [3–5]. However, studies on penile sen-

sitivity in sexually functional men are few in number and have focused on sensitivity of either the flaccid or the erect penis, not both [6–8]. Although research on sensory stimulation of the flaccid penis has clear clinical significance when evaluating patients whose penile sensitivity may be altered by neuropathy associated with various disorders, the study of penile sensory thresholds in

both flaccid *and* erect penises can be expected to have added value and implications for sexual health and medicine beyond the scope of male sexual dysfunction. In addition, investigating the ways in which condoms affect penile sensation and sensory thresholds may have implications for the development of interventions for men who report condom-associated erection problems (CAEPs) or decreased sensation, both of which have been associated with inconsistent or incomplete condom use [9].

Erection problems and loss of sensation, together with condom breakage or slippage and problems with “fit and feel,” are among the most commonly reported condom-associated problems in men [9]. While the correlates of breakage and slippage have received substantial attention in the sexual health literature, surprisingly little research to date has addressed the roles of arousal, CAEPs, and loss of sensation when using a condom. Recently, studies have found that condoms can negatively impact sensations and that sensation loss is an important self-reported reason for men and women to sometimes avoid or abandon using condoms [9]. Although a laboratory approach to the study of penile sensitivity in condom-using men would allow for a more controlled way to assess penile sensations (e.g., in the absence of a partner and other situational and possibly interfering factors), a quantitative, psychophysiological investigation examining the degree to which sensations are altered by condoms has, to date, not been conducted.

The aim of the current study was to examine penile vibrotactile sensitivity thresholds in both flaccid and erect penises in men who do and men who do not report CAEPs. Additionally, we examined how the use of a male condom may alter penile sensory thresholds. The current study utilized biothesiometry, a reliable and validated method for assessing vibrotactile sensitivity thresholds in the human body including the genitalia [4,5,8,10].

Methods

Participants and Testing Procedures

Participants were recruited using public and university advertisements (e.g., online classifieds, flyers, and newspaper advertising). Men were eligible if they were self-identified heterosexual, between 18 and 29 years of age, not in a committed relationship, and if they had used condoms for penile–vaginal intercourse within the past 90 days.

Men reporting CAEPs were oversampled. Participants were asked to complete an online questionnaire and participate in laboratory session examining the psychophysiology of condom use among young condom-using men. The questionnaires focused on demographic information, sexual history, and included the Condom Use Errors/Problems Survey [11] and the International Index of Erectile Function (IIEF) [12]. Men were classified as CAEP if they indicated that they had experienced problems with erection loss during condom application and/or during penile–vaginal intercourse while using condom at least occasionally during the previous 90 days.

Penile sensitivity thresholds were measured using a biothesiometer (Biomedical Instruments, Newsbury, OH, USA). Previous research has demonstrated biothesiometry, which utilizes vibrotactile stimulation, as a reliable method to measure penile sensitivity thresholds [4,5,8,10]. The biothesiometer used a fixed frequency of 100 Hz with variable amplitude, expressed in volts [10]. Thresholds were established using a staircase method: stimulation started at zero and was increased in intensity until the participant indicated that he could detect the vibration. After this, the amplitude of the stimulation was gradually decreased until the participant indicated that he could no longer detect the stimulation. This two-step approach was repeated three times within each condition.

Penile sensitivity thresholds were assessed during four different conditions, in the following, fixed order: (i) erection with a condom; (ii) flaccid with a condom; (iii) erection without a condom; and (iv) flaccid without a condom. Participants were shown a series of 1.5-minute film clips that included two erotic film clips, shown prior to the erection conditions and two neutral film clips, shown prior to the flaccid conditions. For condom-associated conditions, participants were asked to apply a standard latex condom to their penis. As a manipulation check for the erection and flaccid conditions, a self-reported degree of erection measure was added to the protocol after approximately one-third of men had participated; therefore, these data are available for the majority of but not all participants. The erection measure was based on a computerized slider, with a scale from 0% to 100%. To measure penile thresholds we used a method based on Schrader et al. [5], which included a medical grade plastic trough (10.2 cm in length) with a holding strap that could be attached to the tractor of the biothesiometer.

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