

Short Communication

Penile Sensitivity - Are We Measuring the Wrong Property?

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OPEN ACCESS**Abstract**

Measurements of skin sensitivity, both to touch and temperature, have historically been based on fine threshold sensitivity – the minimum stimulus which can be detected. This study shows that this does not correlate with the intensity with which an above-threshold stimulus is perceived. The present study describes a very preliminary trial of what may prove to be a more appropriate measurement protocol.

Keywords

- Penis
- Glans
- Sensitivity
- Touch
- Temperature
- Shower test

INTRODUCTION

Conventional measurements of skin sensitivity are based on discovering the ‘detectability threshold’ – the minimum stimulus which can be perceived. Sensitivity is particularly relevant when we consider the genital organs because of its significance in sexual response.

The glans penis is richly innervated. Superficially, free nerve endings predominate, hugely outnumbering corpuscular receptors [1]. These are typically responsive to temperature [2]. Meissner’s corpuscles, which respond to touch are reported as absent [2] or scarce [3]. Since free nerve endings can also respond to touch [4] it has therefore generally been assumed that they are responsible for tactile sensation in the glans [1,2,5]. Sexual response is mediated by genital corpuscles (modified Krause’s end bulbs) which are most numerous in the corona and near the frenulum [2,4]. They do not form part of this report.

Many studies have measured the sensitivity of the glans surface to touch and temperature thresholds, showing little difference from other glabrous skin areas [5]. However, anecdotally it is clear that stronger stimuli are felt much more intensely than on other glabrous areas. Our proposed hypothesis, therefore, is that threshold sensitivity does not correlate well with perception of stimuli which are above threshold level.

A similar suggestion was proposed more than 100 years ago. Halata and Munger [2] described a 19th century test of fine touch and pain sensitivity carried out by von Frey, using a calibrated hair. He found the glans to be very insensitive to fine touch but very sensitive to pain, with only a small difference in applied force separating the two thresholds. Quoting Halata and Munger: “Stated simply, in the case of the glans the pain threshold is the

tactile threshold, whereas in glabrous digital skin the threshold for touch is much less than the threshold for pain.” [2]

This clearly reflects a limitation of von Frey’s crude measurement technique since if it were true and there were nothing between total lack of sensation and pain, male sexual life would be severely constrained, if not excluded. One aim of the present study was therefore to find a method of assessing the intensity of tactile sensation – above the detectable threshold – in the glans penis as compared to other skin. In other words, to assess sensation between the fine touch and pain thresholds.

Similar considerations apply to temperature sensitivity. The glans penis is very well endowed with temperature receptors [1,2,5] but fine measurements [2,5] again show no difference in perceptible threshold between the glans and other glabrous skin. As before, this does not match anecdotal evidence [6].

This study therefore developed a crude, but simple, protocol, the ‘Shower test’ to evaluate these two factors. The aim was more to see if there is a basis for future work than to provide a definitive conclusion. The results can only be regarded as indicative.

MATERIALS AND METHODS

A simple, self-administered test was devised to evaluate glans sensitivity to touch and temperature. The concept was to avoid any sexual component which might bias the results. Participants were not asked whether they were circumcised but the instructions made clear that the glans must be exposed.

The shower test*Tactile sensation:*

If you run the shower very strongly or on a massage setting,

does your bare glans feel it: much more intensely / a bit more intensely / much the same as the rest of your body?

Temperature sensation:

If the shower suddenly runs hot or cold, does your bare glans (knob) feel it: much more intensely / a bit more intensely / much the same as the rest of your body?

This survey was posted on an Internet discussion group. Respondents were all adult males.

RESULTS

Touch

If you run the shower very strongly or on a massage setting, does your bare glans (knob) feel it:

Much more intensely than the rest of your body	39%	(14)
A bit more intensely than the rest of your body	50%	(18)
Much the same as the rest of your body	11%	(4)

So 89% of the respondents found that a stronger tactile stimulus was experienced more intensely than elsewhere on the body.

Temperature

If the shower suddenly runs hot or cold, does your bare glans feel it:

Much more intensely than the rest of your body	45%	(14)
A bit more intensely than the rest of your body	32%	(10)
Much the same as the rest of your body	23%	(7)

So 77% found that a stronger thermal stimulus was perceived more intensely than elsewhere on the body.

There are inevitable limitations to this survey but the trend is obvious. Both touch and temperature are experienced more strongly on the glans penis than elsewhere on the body. "Much more intensely" was the largest response for temperature while "More intensely" was for touch, suggesting that the difference in response may be greater for temperature, but limitations on the design, discussed below, mean that this is not definitive.

DISCUSSION

Even though the sample size was relatively small and the conditions not under the control of the experimenter, the results are unequivocal. Fine threshold measurements do not give a meaningful measure of the intensity with which real-world sensations are perceived. This really should not come as

a surprise when one considers the density of free nerve endings) in the glans [1].

Is the temperature effect really stronger? There are biological reasons (discussed below) why this might be so, but the limitations of a self-administered test mean that this cannot be conclusive. Most showers can be run at any temperature from that of the input cold water up to 50°. (Hotter temperatures, which could cause scalding, are in any case not relevant). In other words, the temperature range at which the effect is measurable is available to everyone. However many showers, either by design (e.g. the currently fashionable overhead 'rain' showers) or because of the limited available water pressure, may not be able to reach a strong enough force to reliably measure tactile response.

A larger sample, using a similar questionnaire, could even out the variables to some extent. However the ideal solution would be to carry out the same test under controlled conditions. For the tactile test a shower head with a pulsating 'massage' feature could be used. A water pressure can be set at which switching between standard shower and pulsating is easily strong enough to elicit the tactile response. No external input is required. Likewise, a thermostatic shower control (common in some countries but not others) could offer defined temperatures for temperature measurement. This does require a large number of volunteers willing to use one (or a matched set) of showers. University students or even military recruits could provide a suitable source.

Which brings us to the functional significance of these measurements. Since circumcision seems to have been the practice of early *Homo sapiens* [7,8] long before the adoption of clothes, the tactile sensitivity could have evolved to protect the penis from harm. But equally, since sexual response depends on the genital corpuscles which are buried and only susceptible to prolonged stimulation, it could have been a function from much earlier in evolution to alert an adolescent to the sexual potential of his penis. A similar argument applies to the extraordinary developmental plasticity of Meissner's corpuscles in the prepuce [9].

It has been proposed that the exquisite temperature-sensitivity might represent part of the reward system that encourages sexual congress. A sexually naïve youth, upon intromission, will experience a "perfect" temperature which his penis could never otherwise sense. This reward mechanism could thereby encourage him to complete the sexual act [5]. Many descriptions of intercourse in fiction refer to a sense of 'belonging' which can be understood in these terms.

CONCLUSIONS

The results presented here show very clearly that fine threshold measurements of tactile and thermal sensitivity are not adequate guides to the intensity with which real world sensations are perceived. We have therefore developed a prototype test to evaluate real-world sensitivity. The present results refer to the penis but the approach could also be applied to other parts of the

body such as the lips. Our initial trial has clear limitations but the technique can easily be adapted to better controlled conditions.

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