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Citation	泌尿器科紀要 (1987), 33(11): 1823-1826
Issue Date	1987-11
URL	<a href="http://hdl.handle.net/2433/119348">http://hdl.handle.net/2433/119348</a>
Right	
Type	Departmental Bulletin Paper
Textversion	publisher

# PSYCHOGENIC ERECTION MONITORING USING THE SEXUAL STIMULATION SCORE IN 150 PATIENTS WITH IMPOTENCE

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To confirm the usefulness of our new erectile function test, Psychogenic Erection Monitoring using Sexual Stimulation Score, we monitored results in 150 patients with suspected impotence. As compared with conventional methods, this new test reduced the number of false negative and positive recordings and proved a useful method for diagnosis of impotence.

**Key words:** Psychogenic erection, Sexual stimulation score, Nocturnal penile tumescence, Erectile function test

There are two objective methods to detect the erectile function, nocturnal penile tumescence monitoring (NPT) and psychogenic erection monitoring (PEM) after sexual stimulation. NPT is widely accepted as a useful method, but requires a special private room and some special equipment. Moreover, the subject must stay in hospital for 3 or more nights.

PEM is a useful way of finding the real erectile function in patients with impotence<sup>1)</sup>. PEM needs no specific equipment,

and can be performed simply and cheaply in an out-patient clinic. However, it is not clear how differently subjects are stimulated by the sexual stimuli. Therefore, there are many false negatives and false positives in the findings of this test. We speculated that comparing between erection and other physical changes after sexual stimulation may be useful for correcting these errors. As the first step, we recorded various physiological changes after sexual stimulation and found that some findings significantly

Table 1. Parameter of polygraph and scoring of parameters.

Parameter of polygraph		Scoring of Parameters				
		score	0	1	2	3
Penile circumference						
EEG		Rate of increase of systolic blood pressure (%)	0-5	5-9	9-	
Pneumogram	(rate) * (P<0.01)	Rate of increase of diastolic blood pressure (%)	0-2	2-6	6-10	10-
Pneumogram	(width) * (P<0.01)	Increase of GSR (instancies/min.)	0-2	2-6	6-10	10-
Galvanic skin reflex	* (P<0.01)	Increase of respiratory rate (instancies/min.)	0-1	1-2	2-4	4-
Body temperature		Increase of width of pneumogram (mm)	0-2	2-4	4-6	6-
Systolic blood pressure	* (P<0.05)					
Diastolic blood pressure	* (P<0.01)					
Pulse rate						

\*. significant correlation with rate of increase of penile circumference

correlated with the rate of increase of penile circumference in volunteers with normal sexual life. We calculated the Sexual Stimulation Score (SSS) which was the sum of the scores assigned to values of high correlating physiological changes (Table 1). As previously reported<sup>2)</sup>, there is a significant correlation between the SSS and rate of increase of penile circumference (Fig. 1).

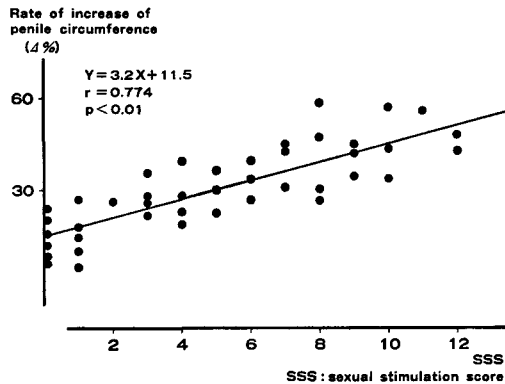


Fig. 1. Rate of increase of penile circumference versus SSS (normal male).

### MATERIALS AND METHODS

We performed PEM and also calculated the SSS in 150 patients complaining of impotence. We monitored for NPT in 99 of 150 patients, and compared those findings. In addition to PEM, for the SSS we made a polygraphic record of the EEG, a pneumogram, a galvanic skin reflex (GSR), and measured body temperature, blood pressure, and pulse rate, with change of penile circumference. The findings of systolic and diastolic blood pressure, respiratory rate and volume, and increased rate of GSR correlated significantly with the rate of increase of penile circumference and were given a value (Table 1), from which the SSS was calculated. Penile tumescence was recorded with a mercury strain gauge.

We divided the findings from PEM and SSS into 5 groups: Rate of increase is 90% or more of that of normal subjects and SSS is 3 or more (Group A). Rate of increase is between 80% and 90% of that of normal subjects and SSS is 3 or more (Group B). Rate of increase is less than

80% of normal subjects and SSS is 3 or more (Group D). No tumescence, but SSS is 3 or more (Group D). SSS is less than 3 (Group N).

NPT findings were divided into five groups<sup>3)</sup>. A periodic high wave classified as "functional", a low wave with periodicity and a high wave without periodicity were classified as "functional-suspected", a low only without periodicity was classified as "organic-suspected" and the rare appearance only of a wave was classified as "organic". Findings with fewer than 3 instances of REM-sleep were not classified.

### RESULTS

#### 1) Psychogenic erection monitoring (Table 2)

In Group A, there were 28 patients with an average age of 36.0 years (S.D. 12.5), in Group B, 25 patients; average age 46.4 years (S.D. 14.6), in Group C, 39 patients; average age 50.8 years (S.D. 13.0), in Group D, 27 patients; average age 49.3 years (S.D. 13.5), and in Group N, 31 patients; average age 44.8 years (S.D. 16.0).

Table 2. Patient distribution and average age in each group.

classification	number	age (mean $\pm$ SD)
A	28	36.0 $\pm$ 12.5
B	25	46.4 $\pm$ 14.6
C	39	50.8 $\pm$ 13.0
D	27	49.3 $\pm$ 13.5
N	31	44.8 $\pm$ 16.0
total	150	46.0 $\pm$ 15.3

#### 2) Nocturnal penile tumescence (Table 3)

According to classification of NPT findings, there were 34 "functionals", 31 "functional-suspected", 22 "organic-suspected", and 12 "organics".

#### 3) Comparison of the two sets of findings

There was no correlation between the NPT findings and increased rate of penile circumference (Fig. 2).

However, there was a significant correlation between the NPT classification and the classification of PEM with SSS. Of the 14 patients in Group A, who were monitored for nocturnal penile tumescence,

Table 3. Classification of NPT and distribution of patients.

Classification of NPT	
Functional	Periodic high wave
Functional susp.	Periodic low wave
	High wave without Periodicity
Organic susp.	Low wave without Periodicity
Organic	Rare appearance of wave
Not classified	<3 instances of REM-sleep

Distribution of patients according to NPT classification	
classification	number of patient
Functional	34
Functional susp.	31
Organic susp.	22
Organic	12
Not classified	0

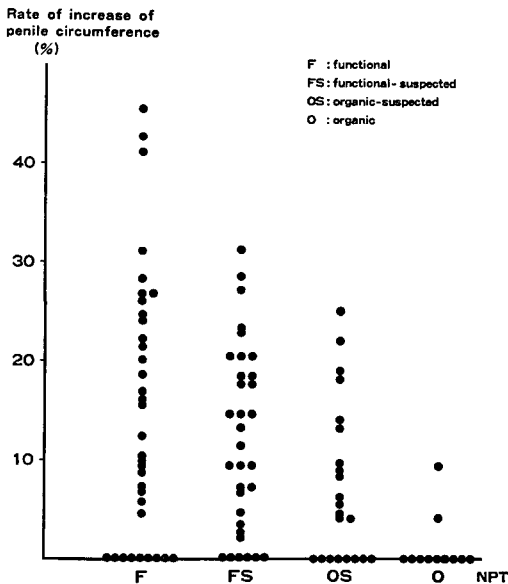


Fig. 2. Correlation of rate of increase of penile circumference and NPT classification.

13 were classified as "functional", and 1 was classified as "functional-suspected" Of 23 patients in Group B, 9 were classified as "functional", 11 as "functional-suspected"

3 and as "organic-suspected" Of 26 patients in Group C, 4 were classified as "functional", 11 as "functional-suspected", 10 as "organic-suspected", and 1 as "organic" Of 17 patients in Group D, 3 were classified as "functional-suspected", 5 as "organic-suspected" and 9 as "organic" There was wide variance in N from "functional" to "organic" (Fig. 3).

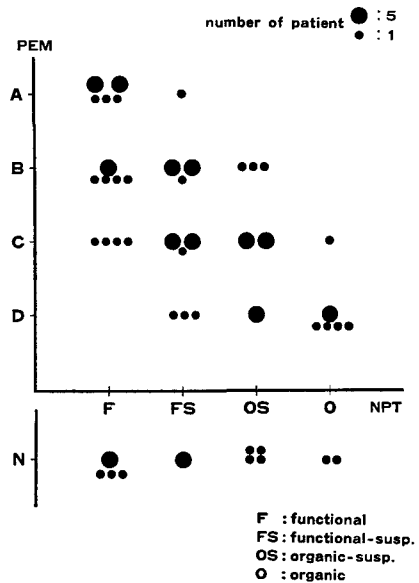


Fig. 3. NPT classification and psychogenic erection with SSS.

In 3 patients in Group B, 5 in Group C and 3 in Group D, there were disparities between PEM and NPT. The disparity rate was 13.0% in Group B, 19.2% in Group C, 17.6% in Group D and 13.7% for all groups combined, excluding Group N. As noted in Fig. 4, there was no tendency in either set of findings. The efficacy rate was 69.6% calculated as follows: Total number (99)—Group D (19)—Mismatched Testing (11)/Total number.

COMMENTS

We previously found that some physiologic changes correlated with the change of the penis after sexual stimulation, and the SSS correlated significantly with the rate of increase of circumference. In this study we performed PEM using SSS

methods. and compared it with NPT.

In the results, the findings of our new method tended to correlate with that of NPT excluding group N. The subjects classified N were patients whose erections were missed or who were not stimulated by the audio-visual asexual stimulation used in this study. Therefore, in patients, classified as N NPT monitoring should be done to know their true erectile function.

Occasionally, there was a disparity between the two findings, except in group A. The rate of mismatch was 13.0% to 19.2%. The disparity may result from the strain gauge detecting tumescence but not rigidity. However, we tend to think that the disparity may be due to personal receptivity to the stimuli, inhibitions reducing the patient's erection.

In spite of some unsolved problems, our new method for testing with SSS can be used in ambulatory patients relatively simply and inexpensively. Furthermore, there are fewer false negatives and positives with test. The recordings of psychogenic erection and SSS after audiovisual sexual stimulation are useful for detection of

erectile dysfunction.

### CONCLUSION

We monitored for psychogenic erections using the Sexual Stimulation Score method in 150 patients with suspected impotence. As compared with usual methods, this new method reduced the number of false negative and false positive recordings, and proved a useful method for diagnosis of impotence.

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(Accepted for publication November 20, 1986)

### 和文抄録

## Sexual Stimulation Score を用いた性的刺激に対する勃起記録 — 150例の検討 —

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性的刺激に対する勃起を記録する方法は、簡単に行なえるなどの利点があるが、刺激の程度を客観的に評価できないことが一番の欠点であった。性的刺激に対する陰茎の変化と同時に生理反応を記録し、生理反応の結果に点数を与える sexual stimulation score 法についてはすでに報告したが、今回はインポテンスを

訴える患者 150 例に本法を施行した。

本法の結果と夜間陰茎勃起現象を比較したところ、従来の陰茎周の変化だけで判定する方法に比べ false negative, false positive とともに減少し、臨床的有用性があるとの結論を得た。