

THE EFFECT OF WARM FOOTBATH BEFORE SLEEP ON THE IMPROVEMENT OF BOTH NOCTURIA AND NOCTURNAL POLYURIA IN GERIATRIC JAPANESE FEMALE WITH BOTHERSOME NOCTURIA. - A RANDOMIZED CROSSOVER STUDY -

Hypothesis / aims of study

Nocturia might be correlated with poor sleep and poor healthy condition. The causes of nocturia in elderly people are multifactorial, and difficult to treat. Previous paper has suggested that both daily bathing and warm footbath before sleeping facilitates earlier sleep onset, and that a warm footbath is especially recommendable for the handicapped, elderly, and disabled, who are unable to enjoy regular baths easily and safely (1). Hence, the objective of this study is to examine the effect of warm footbath before going to bed on the improvement of nocturia in the elderly people by a randomized crossover method.

Study design, materials and methods

Materials; Eighteen female elderly people (older than 65 years old) with nocturia were included into this study with a full-informed consent. Inclusion criteria were 1)Desire to void, 2)Without urinary incontinence, 3)Able to void by herself or order help to void, 4)Without cardiac or renal disorder, 5)Without any use of diuretic agent, 6)Without dementia, 7)Be able to communicate with other people. The effect of intervention (warm footbath before going to bed) was properly examined by a cross-over method.

Crossover design; Eighteen female elderly people were randomly assigned into 2 groups (A and B). Group A; 6 days with intervention (4days' warm footbath), 1 week washout, and then 6 days without intervention. Group B; 6 days without intervention, 1 week washout, then 6 days with intervention (4days' warm footbath).

Warm footbath; 30-60 minutes before going to bed, the peoples sit on the chair, and 40C warm water was filled until the depth of the ankle for 10 minutes. Then, they went to bed just after warm footbath.

Methods for evaluation; frequency volume chart (FVC) for detailed examination for nocturia, Actigram by Mini-Motionlogger Actigraphs (AMI, USA) and OSA sleep inventory for sleep condition and sleep impression (2), and KHQ for QOL analysis, were used during both 6 days' intervention period and 6 days' without intervention period.

Data were expressed as mean \pm s.d.mean, and statistical analysis was made by paired t-test, and Man-Whitney's U-test.

Results

The number of nocturia according to FVC was 1.8 ± 0.9 times in with intervention period, and was 2.8 ± 1.2 times in without intervention period ($p < 0.000$). Nocturnal urine volume was 559.3 ± 248.7 ml in with intervention period, and was 678.2 ± 258.6 ml in without intervention period ($p < 0.001$). Nocturnal mean voided volume was 199.7 ± 64.7 ml in with intervention period, and was 180.7 ± 54.9 ml in without intervention period ($p < 0.03$). Nocturnal polyuria index was 40.6 ± 11.5 % in with intervention period, and was 47.0 ± 10.9 % in without intervention period ($p < 0.001$). There was no difference in blood pressure in anyone of morning, after lunch, or before sleep between with intervention and without intervention period. Sleep condition, sleep impression, and KHQ for QOL were better in with intervention period than in without intervention period (table).

Interpretation of results

Warm foot bath improved sleep condition, and the beneficial effect on sleep might have good effect on nocturia. The detailed mechanism of warm footbath on sleep is unclear.

Concluding message

These results suggest that warm footbath improved nocturia by nocturnal polyuria and nocturnal bladder volume, and also sleep condition.

Table. Comparative data between Warm footbath and Control

Indices		Warm footbath (n = 18)	Control (n = 18)	P value
Urine volume(ml)	Night	559.3 ± 248.7	678.2 ± 258.6	0.001
Nocturnal Polyuria index(%)	NPI	40.6 ± 11.5	47.0 ± 10.9	0.001
Nocturia	Night	1.8 ± 0.9	2.8 ± 1.2	0.000
Mean voided volume(ml)	Night	199.7 ± 64.7	180.7 ± 54.9	0.03
Total sleep time(min)		504.8 ± 163.2	486.0 ± 152.3	0.36
Night sleep time(min)		370.9 ± 80.6	375.0 ± 78.4	0.71
Nocturnal awake(times)		4.5 ± 2.3	5.6 ± 2.8	0.000
Nocturnal awake time (min)		101.4 ± 63.2	136.4 ± 70.4	0.001
Sleep efficiency (%)		78.3 ± 13.6	73.5 ± 13.9	0.01
OSS				
Factor 1	Morning sleepiness	18.1 ± 2.2	16.8 ± 3.0	0.10
Factor 2	Keep sleeping	16.8 ± 3.7	15.1 ± 4.2	0.04

Factor 3	Dreaming	25.3±4.1	25.6±3.7	0.85
Factor 4	Recovery from fatigue	19.4±7.1	18.6±6.4	0.38
Factor 5	Sleeping time	21.1±5.1	18.5±3.1	0.05
KHQ				
	Present health condition	42.6	39.7	0.63
	Influence of nocturia on life	41.2	49.0	0.43
	Restriction for work and housekeeping	33.3	43.1	0.33
	Restriction for physical activity	21.6	58.8	0.007
	Restriction for social activity	12.1	40.5	0.03
	Problem of feeling	32.0	43.1	0.44
	Sleep, activity	13.6	46.1	0.000

References

1. J. Physiol. Anthropol. Appl. Hum. Sci., 19, 1:21-27, 2000.
2. Brain Sci. Ment. Disord. 10: 401-409, 1999 (in Japanese).

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Is this a clinical trial?	No
What were the subjects in the study?	HUMAN
Was this study approved by an ethics committee?	Yes
Specify Name of Ethics Committee	Ethics Committee, University of Yamanashi
Was the Declaration of Helsinki followed?	Yes
Was informed consent obtained from the patients?	Yes