

Mandom Corporation & Norinaga Shimizu, MD, Emeritus Professor of Osaka Prefecture University Findings:

Head Massages Before Bed Improve Sleep Quality

Effects of Mental and Physical Relaxation, Short Sleep Latency, and Increased Slow-Wave Sleep Time, thus effective on Beauty

Mandom Corporation (Headquarters: Osaka, President Executive Officer: Motonobu Nishimura; hereafter, described as Mandom) and Norinaga Shimizu (MD, Emeritus Professor of Osaka Prefecture University and Director of Institute of Life and Health Studies) have focused on the relationship between sleep and beauty and are researching how high-quality sleep affects beauty.

We know that secretion of growth hormones becomes more active during sleep, and that these hormones play an important role in skin turnover (skin metabolism). Further, we know that these growth hormones are most commonly secreted within the first three hours of sleep: deep sleep (non-REM sleep). From these facts, it can be concluded that merely sleeping is not sufficient; understanding how to achieve best deep sleep—that is, high quality sleep—is important for beauty (refer to Page 2 for more information).

In our research, we enrolled women from age 30 – 55 as subjects for an experiment examining the effects of a head massage while bathing before sleep. We found that massaging one’s head in the bath immediately before sleeping had a relaxing effect on the body, shortened time before falling asleep, and improved sleep quality. Our results imply that self-care before sleep enables improvement of sleep quality, which helps cultivate one’s beauty. Unlike skincare, which is externally effective, this practice can internally affect beauty-heightening characteristics.

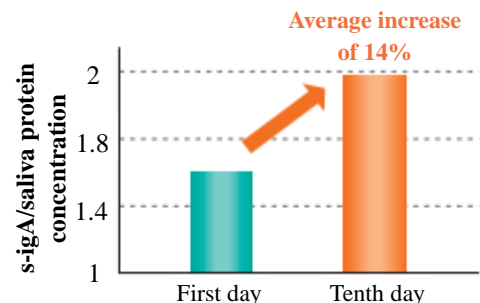
[Study Parameters and Methodology]

1. Subjects: 20 healthy women aged 30-55
2. Study Parameters:
 - ① Analysis of immune levels [secretory immunoglobulin A (s-IgA/protein ratio)] during sleep as an indicator of relaxation
 - ② Brainwave analysis to determine effect on time passed before falling asleep (sleep latency)
 - ③ Brainwave analysis to determine effect on duration time of slow-wave sleep
3. Methodology: Subjects were asked to use head massage cream provided by our company to perform head massages on themselves according to specified instructions for 10 nights consecutively; parameters were monitored during this time.

1. Head Massages Enable Relaxation

We asked subjects to use a head massage cream provided by our company to perform head massages on themselves for 10 nights consecutively; we measured amounts of secretory immunoglobulin A (s-IgA) in their saliva upon waking. s-IgA is a material involved in human immunity and its secretion is known to increase when one experiences a state of relaxation. As a result of our experiment, we found that s-IgA secretion had increased 14% in our subjects compared to their levels on the first day of the experiment (Figure 1).

Figure 1: Change in s-IgA/protein ratio concentration caused by head massage (Average of 10 subjects)



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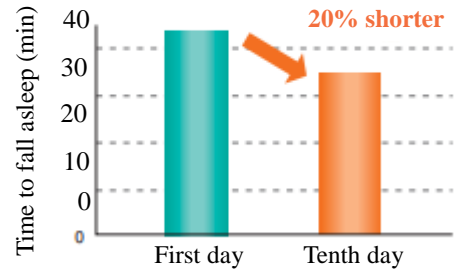
URL: <https://www.mandom.co.jp/en/>



2. Head Massages Improve the Ease of Falling Asleep

Under the same experimental conditions outlined above, we measured subjects' brainwaves in bed to calculate the amount of time elapsed between entering their bed and actually falling asleep (time to fall asleep). We found that after 10 days, the time elapsed before fall asleep had shortened by 20% (Figure 2).

Figure 2: Change in time to fall asleep caused by head massage (Average of 10 subjects)



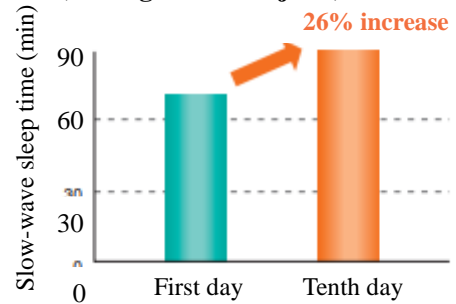
3. Head Massages Heighten Sleep Quality

We used the same brainwave measurement system outlined above to calculate the length of subjects' slow-wave sleep. We found that, compared to when they were not performing head massages, the length of subjects' Stage 3 + 4 sleep—the deepest parts of non-REM sleep—had increased by 26% (Figure 3).

From these results, we can conclude that head massages enable relaxation, facilitate falling asleep, and improve sleep quality.

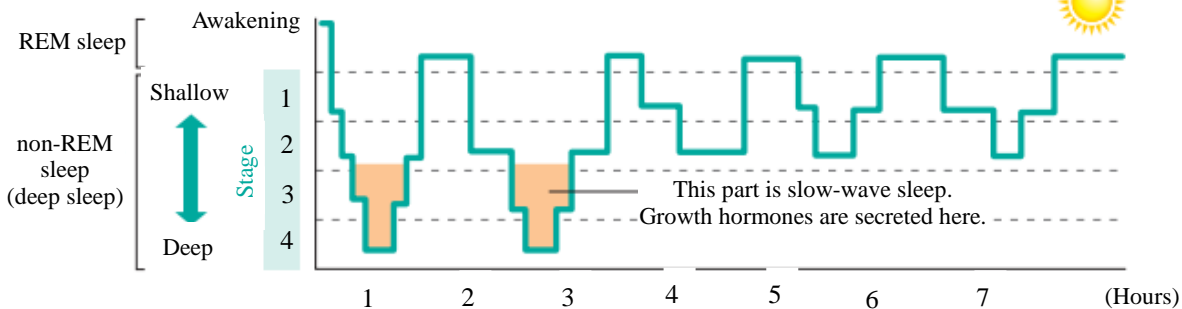
At Mandom, we plan to continue this line of research and develop products beneficial to beauty from the perspective of sleep health science.

Figure 3: Change in slow-wave sleep time caused by head massage (Average of 10 subjects)



<Reference Material>

Figure 4: Sleep Rhythm (example)



Citation: Toru Abo, Norinaga Shimizu, co-authors. "How to Live Life with a Healthy Body Temperature of 36.5°C," Jitsugyo no Nihon-sha.

REM Sleep and Non-REM Sleep

Sleep cycles are comprised of two phases: sleep for the body, called as "REM sleep," and sleep for the mind, called as "non-REM sleep." Immediately after falling asleep, we enter non-REM sleep and sleep deeply for about 1 hour. Because this stage of sleep is one that rests our mind, our pulse, body temperature, and basal metabolism decrease. Afterwards, our sleep becomes shallower as we enter REM sleep for about 5-10 minutes before re-entering non-REM sleep. One sleep cycle, which contains both types of sleep, takes about 90 minutes; we usually have 4-5 of these sleep cycles per night.

Slow-wave Sleep

Stages 3 and 4 of non-REM sleep are particularly deep and are referred to as "slow-wave sleep". We know that secretion of growth hormones and other compounds becomes more active in these stages of sleep. Among the various hormones secreted during sleep, growth hormones encourage rebirth of skin cells and are particularly indispensable for recovering from fatigue and maintaining beauty.