

Conclusion

Up to now, the results of a desensitizing process with Andullations are very promising in regards to the physiological parameters, but neither of the two tested systems was superior to the other in general. It has become clear that vibrations are effective at combating sea-sickness, but these vibrations can be applied either while standing or lying down. Time is of the essence when desensitizing, however; therefore, treatment should be applied a short time before the actual journey. Once symptoms of sea-sickness set in (see control group), Andullations while lying down seem to grant patients greater relief. In a subsequent study, members of the control group recovered significantly quicker while being oscillated on hhp Andullation Therapie System. These results speak in favour of a treatment employing the hhp Andullation Therapie System provided that sea-sickness has already set in.

Figure 4: Recovery from the symptom of nausea by different types of Andullation.



For applications at home or onbord , the foldable hhp Andullation Therapie System seems to be superior to heavy and cumbersome Galileo-Devices, which can be stowed only with great difficulty due to their considerable size. Despite these striking results, additional studies will be necessary to shed more light on the phenomenon of sea-sickness and the possible ways of combating it. The hhp Andullation Therapie System



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SEA-SICKNESS

Possible treatment of sea-sickness without medication

Concerning the effect of the Andullation method to combat sea-sickness

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Performance of study: biomed GbR



Introduction of the problem

Sea-sickness (kinetosis) is commonly understood to be the reaction of the human body to the unfamiliar rocking motion and acceleration of vessels. Sea- and travel-sickness can afflict anybody; in about 90% of the cases the symptoms dissipate within two to three days, however. A number of household remedies and a simple code of conduct can be helpful in many cases, but using medication of any kind to treat the symptoms is a disputed topic amongst experts.

Due to the large number of people afflicted amongst members of the navy, there has been an extensive amount of research on sea-sickness. Despite these research projects, the exact cause and effect relations have yet to be identified. It has been established that conflicting sensations from the eyes and vestibular apparatuses combined with cerebral misinterpretations of said sensations apparently play a pivotal role in the onset of sea-sickness. Other factors can make sea-sickness even more prevalent, though: a heightened sensibility of the vestibular apparatus responsible for the sense of balance (statistically speaking, Asians are afflicted more often) as well as unfavourable general conditions like anxiety or stomach contents seem to be the most important factors. Other factors such as consumption of alcohol during transit (or even on the eve of a journey), smoking, lack of sleep, stress due to conflicts onboard and physical discomfort due to heat, cold, influenza and menstruation can aggravate the symptoms.

To investigate the physiological processes involved in sea-sickness, the Hershey Medical Center in Pennsylvania (among other similar institutions) makes use of special simulators to cause sea-sickness intentionally. After evaluating the adaptive reactions during and after a patient suffers from seasickness the research-group tries to employ Eastern acupuncture and acupressure methods to soothe the symptoms of sea-sickness.

Research approach

Despite the attempts of the pharmaceutical industry to dominate the treatment of travel-sickness with numerous products, a number of experts suggest that sea- and travel-sickness should not be treated with medication but rather with dedicated preparatory therapies, i.e. codes of conducts to lessen the symptoms of sea-sickness or even prevent it altogether.

One of these methods involves irritating body sensors. Pain, pressure and proprioception sensors can be desensitized by short-term irritations. The application of andullations and vibrations has proven to be very effective in this regard. High-frequency vibrations can be applied to the human body for a few minutes while standing (Galileo) or while lying down (hhp Andullation Massage). At frequencies in excess of 25 Hertz, the organism's biological sensors are overloaded, therewith granting an immediate resistance to pain. Experiments with male adult volunteers have demonstrated the effectiveness of prior Andullation treatments at granting a resistance to the mechanisms causing sea-sickness.

Methodology

86 healthy volunteering students took part as subjects in this study. These test subjects were distributed amongst three sub-groups. Sub-Group 1 served as a control group and did therefore not receive any treatment. For ten days, Sub-Group 2 was desensitized with a daily 15 minute application of Andullations while standing - for this desensitizing process, an apparatus developed by Human Mobility was used. Sub-Group 3 was desensitized daily while lying down using an Andullation bed by hhp. At the beginning as well as at the end of the ten day interval, all members had to visit a simulator/drum (in the style of the experiments undertaken by the Hershey Medical Center, Pennsylvania) to cause Immediately after the symptoms of sea-sickness caused by the simulator set in, physiological parameters were recorded and a questionnaire was filled out by the participants.

The direct interference statistical comparison of the three sub-groups was calculated with an analysis of variance. This analysis was based on differential values which in turn resulted from comparison of values before and after the ten day interval.

All physiological parameters like heart rate, blood pressure, coordination and skin temperature were checked by licensed nurses under supervision of a medical doctor.

The questionnaire tested the subjective reactions of the participants in regards to tiredness, weakness, nausea, vertigo and sickness with intervallic scale levels using a visual analogue scale. The results of the re-testing after the culmination of the ten day interval were noted with no knowledge of prior results.

Presentation of results

Physiological parameters

While the control group containing those subjects who had not undergone any desensitizing measures at all displayed more or less the same results in the second round of testing following the intentional induction of sea-sickness, it became evident that in both groups whose members were subjected to desensitizing measures using Andullation the physiological parameters had improved significantly. The steep increase of heart rate and blood pressure, which accompanied the initial onset of sea-sickness, could be diminished to a satisfactory degree. This effect is demonstrated by a reduction of the medial heart rate in sub-groups 2 and 3 by 19,3 and 18,7 heartbeats per minute, respectively (figure 1). The same applies to the rise of blood pressure, which was lowered by -42,7 in sub-group 2 and -39,8 in sub-group 3.

Figure 1: Presentation of the difference in heart rate after a ten day interval of desensitizing with Andullations.



Figure 2: Presentation of the change in medial blood pressure after a ten day interval of desensitizing with Andullations.



While there were no changes evident in coordination skills of the control group, both treatment groups showed significant improvement during testing. The desensitizing phase (with the application of Andullation while lying down or standing) led to a marked resistance to a decrease of coordination skills while suffering from sea-sickness.

Figure 3: Presentation of the change in coordination skills test results after a ten day interval of desensitizing with Andullations.



The evaluation of the subjective reactions of the test-subjects in regards to tiredness, weakness, nausea, vertigo and sickness proved to be less articulated as only minor increases below the point of significance could be found.

