재활보조기구

게시일시 및 장소 : 10 월 19 일(토) 08:30-12:30 Room G(3F)

질의응답 일시 및 장소 : 10 월 19 일(토) 11:00-11:30 Room G(3F)

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The effect of customized insole hardness on the foot pressure of stroke patient

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Objective

The purpose of this study was to investigate the effect of customized insole hardness on foot pressure during a static standing posture with stroke hemiplegia.

Method

46 stroke patients who were hospitalize at the rehabilitation center were recruited and 3 patients eliminate from them. The foot pressure distribution was measured by device(Pedar-X) while patient maintained a static standing posture. hardness of soft and rigid insole were classified by measuring using an A-type hardness taster(Shoer A, CL-150, Asker, Japan). The evaluation was divided into two parts: a trial with Pedar-X in the shoes and a trial with the pedal-X with the insole in the shoes. The subjects were placed in the center of the laboratory, and the legs were allowed with the shoulder width wide and arms were allowed to cross the chest. Take a posture with eyes open and stating ahead for black dot. The foot pressure was measured for 30 seconds while maintaining posture and it repeated 3 times. Measurements were taken at the great toe, little toe, medial metatarsal, lateral metatarsal, medial arch, lateral arch, and heel 7 section. The data were analyzed using the IBM SPSS statistics ver. 18.0 statistical program. A paired-t test was performed to compare the foot pressure of the before and after wearing the insole. An independent t-test was performed to compare soft and rigid delta values. The level of significance at a P-value of <.05.

Results

The soft insole showed a significant differences in medial metatarsal, lateral metatarsal, medial arch, lateral arch and heel before and after wearing insole. The Rigid insole showed a significant differences in little toe, medial metatarsal, lateral metatarsal, medial arch, lateral arch and heel before and after wearing insole.In comparison soft and rigid insole hardness showed a significant difference in medial arch and lateral arch.

Conclusion

As a result, wearing soft and rigid insoles both affect the foot pressure. Soft and rigid insoles were compared before and after wearing. In the most heavily pressures of the medial metatarsal and lateral metatarsal areas decreased and the pressure of the medial arch and the lateral arch increased after wearing the insole. Wearing insole was shown to disperse the pressure of metatarsal caused by the insole supported the medial arch during the static standing posture. Rigid insole has higher hardness than soft insole, and it is thought that difference is caused by supporting arch more strongly. The results of this study showed that wearing the insole and the hardness of the material had effect on dispersing pressure. In the follow-up study, force and area analysis should be performed as well as pressure dispersion of the foot pressure change by different hardness of insole.

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Table1. Soft and Rigid insole Foot Pressure

[kPa]

	Eyes Open								
	SIG (n=21)				RIG (n=22)				*t*
Parameters	*pretest*	*Posttest*	*t*	*ΔValues*	*pretest*	*posttest*	*t*	*ΔValues*	
Great toe	0.56±0.35	0.63±0.44	0.720	0.42±0.55	0.46±0.47	0.57±0.50	1.130	0.27±0.65	-0.791
Little toe	0.45±0.30	0.45±0.28	0.048	0.23±0.41	0.40±0.25	0.55±0.31	2.099*	0.20±0.33	-0.205
M-metatarsal	0.67±0.33	0.50±0.18	-2.995**	-0.27±0.27	0.65±0.39	0.49±0.25	-2.947**	-0.15±0.29	1.348
L-metatarsal	0.78±0.28	0.61±0.21	-4.121**	-0.18±0.19	0.60±0.18	0.49±0.18	-2.896**	-0.15±0.28	0.389
Medial arch	0.27±0.22	0.47±0.21	3.373**	0.19±0.20	0.21±0.22	0.79±0.24	7.685***	0.60±0.39	4.333***
Lateral arch	0.61±0.27	0.75±0.27	2.943**	0.09±0.17	0.38±0.22	0.72±0.14	6.295***	0.35±0.26	3.758**
Heel	1.33±0.39	1.02±0.34	-6.135***	-0.23±0.22	1.44±0.44	1.12±0.39	-7.785***	-0.16±0.27	0.882

Values are expressed as mean ± SD
* Significant differences between pre- and posttest
+ Significant differences for change of value between 2 groups
P<.05*, P<.01**, P<.001***