Immediate Effect of Mobilisation With Movement on Pain and Physical Function during Squatting in People with Different Structural Severity Degrees of Symptomatic Knee Osteoarthritis: a Randomised Controlled Trial

Gomes, V.; Simões, G.

INTRODUCTION

Mobilisation with movement (MWM) is a manual therapy strategy that combines neurophysiological and biomechanical principles, allowing a safe and conservative approach. Despite the literature showing its immediate effect on the pain and physical function in people with symptomatic knee osteoarthritis (KOA), it is still unknown whether the structural grade interferes with this effect.

METHODS

A randomised controlled trial was conducted with a sample of volunteers of both sexes, aged ≥45 years with symptomatic KOA, which were randomly divided into experimental (EG) and placebo (PG) groups, according to the severity of KOA (stratified sampling process). The EG underwent a technique of MWM (lunge combined with accessory movement that resulted in greater pain relief) and the PG received a sham MWM (only lunge).

pain intensity (through Numeric Pain Rating Scale) and the physical function (level of activity limitation through Patient Specific Functional Scale, and knee range of movement – ROM) during squatting were evaluated, before and immediate after the intervention. The t test for 2 independent samples was used with a significance level of 0.05.

Figure 1 - MWM lateral glide in weight-bearing position
Figure 2 - MWM medial glide in weight-bearing position
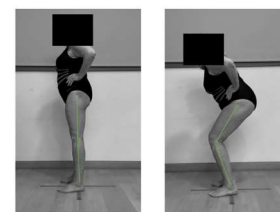Figure 3 - MWM medial rotation in weight-bearing position

Figure 4 - Functional Squat Test

RESULTS

Both EG and PG were composed by 20 people with KOA, of which 10 had grade 2 – EG2 or PG2, and another 10 had grade 3 – EG3 or PG3. Pain intensity [(EG<PG: p<0.001); (EG3<PG3: p=0.005); (EG2<PG2: p=0.006)] and activity limitation significantly decreased [(EG>PG: p<0.001); (EG3<PG3: p=0.006); (EG2<PG2: p<0.001)] and knee ROM significantly increased [(EG>PG: p<0.001); (EG3<PG3: p=0.022); (EG2<PG2: p<0.001)] during squatting in the MWM groups, compared to the placebo groups.

There were no significant differences between the EG2 and PG2 groups in the different variables under study.

Tables 1, 2 – Between-groups comparison

Legend:
EG: Experimental group
PG: Placebo group
EG2: Experimental group with grade 2 of KOA
EG3: Experimental group with grade 3 of KOA
PG2: Placebo group with grade 2 of KOA
PG3: Placebo group with grade 3 of KOA

Variable	Sex (n males)	Age (years)	IMC (kg/m^2)
Experimental			
All (n=20)	45% (n=9)	67,25 ± 9,24	27,59 ± 2,97
Grade 2 (n=10)	30% (n=3)	61,20 ± 7,71	28,31 ± 2,55
Grade 3 (n=10)	60% (n=6)	73,30 ± 6,27	26,86 ± 3,31
Placebo			
All (n=20)	15% (n=3)	66,15 ± 11,29	29,30 ± 4,00
Grade 2 (n=10)	10% (n=1)	62,60 ± 12,18	28,53 ± 4,35
Grade 3 (n=10)	20% (n=2)	69,70 ± 9,63	30,07 ± 3,68
Between-group comparison			
Experimental vs. Placebo	E>P p=0,038	E=P p=0,738	E=P p=0,132
Experimental Grade 2 vs. Placebo Grade 2	EG2=PG2 p=0,264	EG2=PG2 p=0,763	EG2=PG2 p=0,892
Experimental Grade 3 vs. Placebo Grade 3	EG3=PG3 p=0,068	EG3=PG3 p=0,335	EG3=PG3 p=0,055
Experimental Grade 2 vs. Experimental Grade 3	EG2=EG3 p=0,178	EG2<EG3 p=0,001	EG2=EG3 p=0,287

Variable	Pain (NPRS)			Functionality (PSFS)			Range of Motion (°)		
	M0	M1	M1-M0	M0	M1	M1-M0	M0	M1	M1-M0
Experimental									
Global (n=20)	5,80 ± 1,32	3,85 ± 2,13	-1,95 ± 1,61	5,20 ± 0,89	6,95 ± 1,05	1,75 ± 0,97	65,60 ± 15,58	75,15 ± 15,03	9,55 ± 6,64
Grade 2 (n=10)	5,50 ± 1,43	3,70 ± 2,11	-1,80 ± 1,62	5,50 ± 0,85	7,30 ± 0,68	1,80 ± 0,63	64,70 ± 15,14	75,70 ± 15,81	11,00 ± 5,77
Grade 3 (n=10)	6,10 ± 1,20	4,00 ± 2,26	-2,10 ± 1,66	4,90 ± 0,88	6,60 ± 1,27	1,70 ± 1,25	66,50 ± 16,77	74,60 ± 15,05	8,10 ± 7,42
Placebo									
Global (n=20)	5,60 ± 1,79	5,45 ± 1,85	-0,15 ± 0,75	5,15 ± 1,79	5,35 ± 1,66	0,20 ± 0,62	60,65 ± 16,05	62,70 ± 16,12	2,05 ± 3,62
Grade 2 (n=10)	4,70 ± 2,11	4,70 ± 2,21	0,00 ± 0,82	6,00 ± 1,83	6,10 ± 1,73	0,10 ± 0,57	67,10 ± 19,61	69,90 ± 19,17	2,80 ± 2,74
Grade 3 (n=10)	6,50 ± 0,71	6,20 ± 1,03	-0,30 ± 0,67	4,30 ± 1,34	4,60 ± 1,27	0,30 ± 0,67	54,20 ± 8,18	55,50 ± 8,13	1,30 ± 4,35
Between group comparision									
Experimental vs. Placebo	E=P p=0,690	E<P p=0,016	E<P p<0,001	E=P p=0,911	E>P p<0,001	E>P p<0,001	E=P p=0,329	E>P p=0,016	E>P p<0,001
Experimental Grade 2 vs. Placebo Grade 2	EG2=PG2 p=0,335	EG2=PG2 p=0,315	EG2<PG2 p=0,006	EG2=PG2 p=0,443	EG2=PG2 p=0,064	EG2>PG2 p<0,001	EG2=PG2 p=0,763	EG2=PG2 p=0,470	EG2>PG2 p<0,001
Experimental Grade 3 vs. Placebo Grade 3	EG3=PG3 p=0,375	EG3<PG3 p=0,015	EG3<PG3 p=0,005	EG3=PG3 p=0,251	EG3>PG3 p=0,002	EG3>PG3 p=0,006	EG3=PG3 p=0,052	EG3>PG3 p=0,002	EG3>PG3 p=0,022
Experimental Grade 2 vs. Experimental Grade 3	EG2=EG3 p=0,323	EG2=EG3 p=0,763	EG2=EG3 p=0,688	EG2=EG3 p=0,137	EG2=EG3 p=0,140	EG2=EG3 p=0,824	EG2=EG3 p=0,804	EG2=EG3 p=0,875	EG2=EG3 p=0,342

CONCLUSION

The MWM technique seemed to have a positive immediate effect on the pain and physical function during squatting, regardless of the degree of structural severity of KOA.

REFERENCES