

Thesis Title **Comparison of Gait Parameters under Speed Constraint in Patients with Degenerative Knee and Normal Females.**

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ABSTRACT

This study was conducted on twelve left knee OA patients and twelve normal females. Both groups were matched for sex, age, height and body weight. The temporal-distance parameters and sagittal angular displacement of the hip, knee and ankle joints were obtained from both groups of subjects during walking on the treadmill with constant speed, at the slope of 0 and 4.5 degrees with barefeet. The left side of the body was studied. All the parameters were studied by means of videograph, grid line and simple computerized process; videoblaster card. The design of this study was descriptive comparative.

The results of this study revealed the following: 1). At slope 0 degree, as compared with normal group, the significant increase of the following parameters were found in OA group; percentage of stance phase (%GC.(St)), knee angle at initial

contact (K1), percentage in gait cycle of peak extension (%GC.H2), percentage in gait cycle of peak dorsiflexion (%GC.A2) and percentage in gait cycle of peak plantarflexion (%GC.A3) with the mean values (and standard deviation) of 68.9 (3.61)%, 9.6 (5.61) degrees, 57.8 (3.62), 42.8 (3.93) and 69.8 (3.62)% respectively ($p < 0.05$). The significant decreases in OA group were found in percentage of swing phase (%GC.(Sw)) and peak of hip extension (H2) with the mean values of 30.2 (3.61)% and -8.5 (3.28) degrees respectively ($p < 0.05$).

2). In the OA group when compared between slope 0 and 4.5 degrees, the significant increases were found at slope 4.5 degrees in angular displacement of hip joint at the initial contact of hip flexion (H1), peak of hip extension (H2), maximum hip flexion (H3), hip flexion at 100%GC. (H4) with the mean values of 26.2 (4.32), -11.2(3.16), 27.5 (3.13) and 26.2 (3.9) degrees respectively ($p < 0.05$); at the initial contact of hip flexion (K1), knee flexion in stance phase (K2), knee flexion at 100%GC. (K5) with the mean values of 14.3 (5.69), 23.2 (5.83) and 15(6.17) degrees respectively ($p < 0.05$); at the initial contact of ankle joint (A1), ankle angle at 100%GC. (A4) with the mean values of -1.2 (2.5) and -0.5 (2.2) degrees respectively ($p < 0.05$).

3). As compared within normal group between slope 0 and 4.5 degrees, the significant increases were found at slope 4.5 degrees for the angular displacement at hip joint at H1, H3, H4 with the mean values of 24 (3.04), 26.1 (2.43) and 24.2 (3.3) degrees respectively ($p < 0.05$); at ankle joint at A1, peak ankle plantarflexion (A3), A4 with the mean values of -1.3 (2.21), -22.6 (4.72) and -1.2 (2.92) degrees respectively ($p < 0.05$). At slope 4.5 degrees, %GC.K2 was found to significantly decrease ($p < 0.05$). The right and left step lengths did not show significant difference within each group and between both

groups at slope 0 and 4.5 degrees ($p>0.05$). However, at slope 4.5 degrees, the step length in both groups showed significantly increased ($p<0.05$).

The results of this study indicated that the left knee OA patients did not demonstrate painful gait as compared with normal group. However, the OA patients walked with awareness in order to maintain stability and balance during walking on the treadmill. This was confirmed by distinguished increase in percentage of stance phase in gait cycle, decrease in hip extension and increase knee flexion at initial contact in knee OA group during walking on the treadmill. No asymmetry of step length was found in OA group.