

The Effect of Oral Contraceptive Pill Use on Knee Joint Laxity in Women

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ABSTRACT

Schultz et al. (2004) demonstrated that 63% of the change in knee joint laxity (KJL) during a menstrual cycle was due to associated fluctuations in sex hormone levels. Use of oral contraceptives modulates the fluctuation of sex hormone levels during the menstrual cycle and thus may reduce fluctuation in KJL

PURPOSE: Given that increased KJL is a known risk factor for sustaining knee injuries, the purpose of this study was to examine the effect of oral contraceptive use on KJL during the follicular, ovulation, and luteal phases of the menstrual cycle. **METHODS:** Sixty college-age women were screened for participation and fourteen (20.07±1.21 years, 163.05± 9.70, and 66.81± 12.32 kg) met the inclusion criteria, provided informed consent, and participated in the study. Based on screening questionnaires, participants were sorted into groups, oral contraceptive users (OC) and non-users (NOC). Each participant's KJL was measured on six occasions, five days apart. KJL was measured using a KT-1000 Knee Arthrometer at 133 N. Measurements on days 1-7, 11-14, and 19-22 were used for data analysis to correspond with the three phases of the menstrual cycle. A 2x3 (group x phase) mixed model ANOVA was used to compare KJL between groups and across the three phases of the menstrual cycle. **RESULTS:** KJL are reported in Table 1. Group and phase did not interact to affect KJL ($F(2,24)=1.92, p=0.17$). KJL did not differ between OC and NOC users across the menstrual cycle ($F(1,12)=0.07, p=0.80$), and was not different between any phase of the menstrual cycle ($F(2,24)=0.14, p=0.87$). However, given that the spike in estradiol associated with the ovulation phase has been suggested to affect ligament laxity, a comparison between groups during this phase was conducted. Though KJL was larger for NOC than OC, the results of a one-tailed independent t-test suggest that this difference was not statistically significant ($t(12)= 1.72, p = 0.06$). However, this difference was characterized by a large effect size (Cohen $d= 0.92$) suggesting that NOC users experience more KJL during the ovulation phase than OC users. **CONCLUSION:** The results of the study indicate that OC may play a role in KJL. However, with limited statistical power of these analyses, additional data are needed to fully assess this effect.

Table 1. Knee Joint Laxity Measures Across Menstrual Cycle.

Group	Joint Laxity (mm)		
	Follicular Phase	Ovulation Phase	Luteal Phase
OC	6.05±2.49	4.83±2.17	5.62±3.73
NOC	5.00±1.37	6.31±2.97	6.07±2.03