



Use of Hormonal Contraceptives is Associated with Decreased Incidence of ACL Injuries Requiring Reconstruction in Females



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BACKGROUND

Females are more likely to experience anterior cruciate ligament (ACL) injuries compared to males. Relaxin, a collagenolytic hormone, among other biomechanical factors play a role in weakening the ACL, consequently increasing the risk of ACL tears in females. Oral contraceptive pills (OCPs) have been found to decrease relaxin in serum and increase ACL strength.

The purpose of this study is to:

1. Investigate the association between hormonal contraception use and females who sustained ACL
2. Determine if OCP formulations with different progesterone levels affect ACL injury incidence in females.

METHODS

- This retrospective cohort study utilized de-identified data from female patients ages 15-35 using Colorado Health Data Compass database.
- ACL injury was filtered by arthroscopic ACL reconstruction treatment.
- OCP formulations included were norethindrone (NE) only, drospirenone (DS) + ethinyl estradiol (EE), NE + EE, and norgestimate (NG) + EE.
- Statistical analysis was completed using Rstudio.

RESULTS

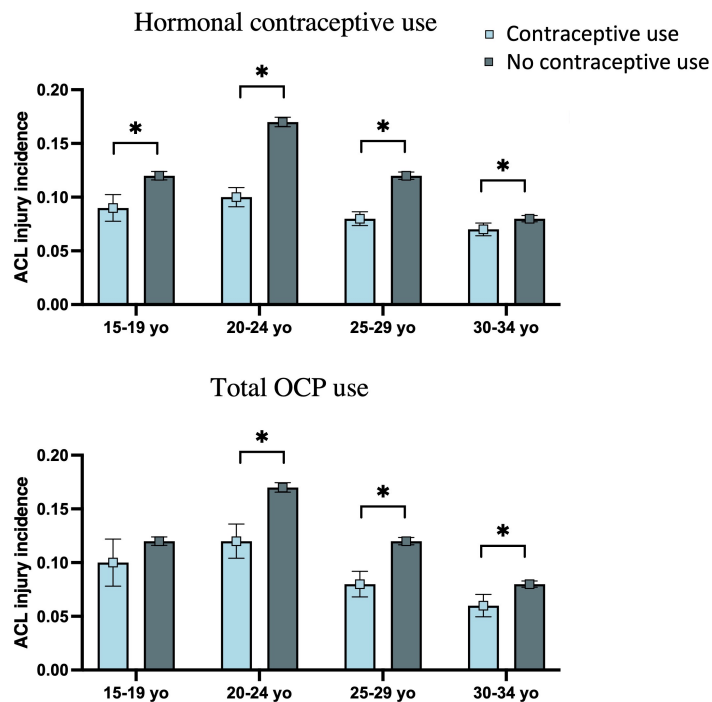


Figure 1. Incidence of ACL injuries in systemic hormonal contraception users and OCP users separated by age.

TABLE 1
Association Between ACL Injury Incidence and Systemic Hormonal Contraceptives or OCP Use

Cohort name	ACL Inj. Freq.	No ACL Inj. Freq	Proportion ACL Inj.	95% CI
Hormonal Contraceptives	1669	2118959	0.079%	[0.075, 0.083]
OCP use, total	654	744408	0.088%	[0.081, 0.095]
No Contraceptive Use	15253	12750885	0.12%	[0.118, 0.121]

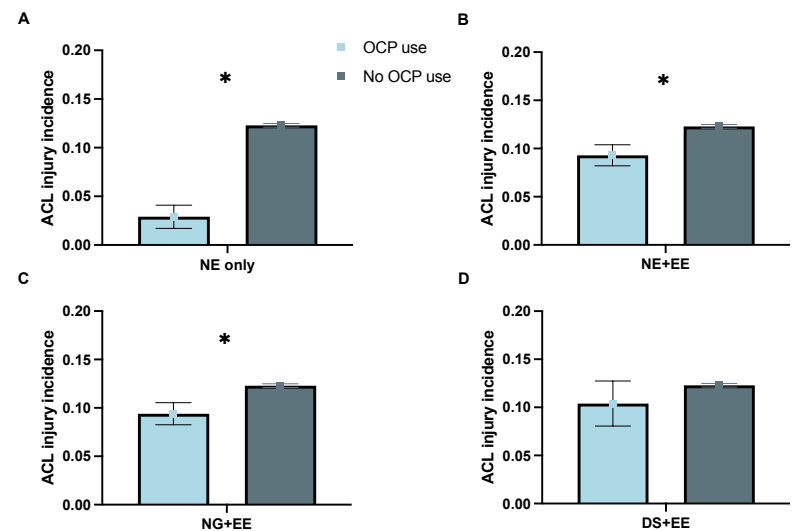


Figure 2. Incidence of ACL injuries in females by OCP formulation

CONCLUSION

This initial evaluation of associations between hormonal contraceptive use and ACL injury incidence has shown:

- Hormonal contraceptive use may be associated with a lower incidence of ACL injuries compared to no hormonal contraception use in females.
- The 15-19 yo age range saw no difference in ACL injury between OCP use groups, suggesting age could be a factor in the effects of OCP use on ACL injury incidence.
- Different progesterone formulations, specifically first-generation progesterone like NE, could play a role in protection against ACL injuries in females.

Further research is warranted to explore additional variables impacting associations, such as mechanism of injury and subject-specific demographics. Investigating if other hormonal contraceptive methods, such as intrauterine devices, show similar ACL injury proportions will be beneficial in finding potential protective interventions to reduce ACL injury incidence in females.

REFERENCES

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