Relative Risk of Cervical Neoplasms Among Copper and Levonorgestrel Releasing Intrauterine Device Users: Preliminary Results from a Network Analysis of Claims Databases

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Research Category: Population-Level Estimation

Introduction

The OHDSI community has presented evidence from a single database to suggest that Cu IUD exposure may decrease the risk of high grade cervical neoplasms relative to LNG-IUS exposure [1]. The objective of this study was to replicate the analysis in multiple claims databases of the OHDSI network.

Methods

We implemented a retrospective, observational, cohort study. Using ATLAS, we made cohorts for Cu IUD and LNG-IUS users that were optimized on data from claims databases. For the new Cu IUD cohort, the index event was either placement or exposure to an intrauterine copper contraceptive as indicated by HCPCS code J7300("Intrauterine Copper Contraceptive"). For the new LNG-IUS cohort, the index event was either placement or exposure to an LNG-IUS as indicated by codes such as RxNorm 1366343 ("Levonorgestrel 0.00354 MG/HR Drug Implant"). All patients had continuous observation for at least 365 days prior to the index event, were 45 years or younger and female. We excluded women with a history of cancer. The study data came from the IBM MarketScan Commercial Claims & Encounters (CCAE), MarketScan Medicaid Multi-state (MDCD) and IQVIA Open Claims databases.

Results

The equipoise between target and comparator cohorts ranged from 79.7% to 86.5%. Covariate balance was achieved in all 1:1 propensity score matched analyses. No covariate differed by a standard deviation of the mean by greater than 0.06. The inferential statistics are shown in Table 1 and a representative Kaplan-Meier plot of high-grade cervical neoplasm-free survival is shown in Figure 1.

Database	Cu IUD cohort count	LNG-IUS cohort count	Cu IUD Cases/1K Persons	LNG-IUS Cases/1K Persons	Cu IUD Cases/1K P-Y (95% CI)	LNG-IUS Cases/1K P-Y (95% CI)	RR (95% CI)	P
IQVIA Open Claims	561572	561572	11.52	13.55	2.49 (2.43-2.55)	2.88 (2.82-2.94)	0.84 (0.81-0.87)	0.03
MDCD	14770	14770	6.78	8.53	4.11 (3.38-5.00)	4.99 (4.19-5.93)	0.84 (0.58-1.21)	0.32
CCAE	109812	109812	7.12	8.11	3.10 (2.89-3.32)	3.38 (3.17-3.61)	0.88 (0.76-1.00)	0.15

Table 1: Inferential Statistics of the Target and Comparator Cohorts After 1:1 Propensity Score Matching From 2003 to 2019 in the Optum Open Claims, IBM MarketScan Commercial Claims & Encounters (CCAE) and MarketScan Medicaid Multi-state (MDCD) Databases. Cu IUD, copper intrauterine device; LNG-IUS, levonorgestrel intrauterine system; 1K,1000; P-Y, Person-Years; 95% CI, 95% Confidence Interval; RR, Relative Risk; P, P-Value.

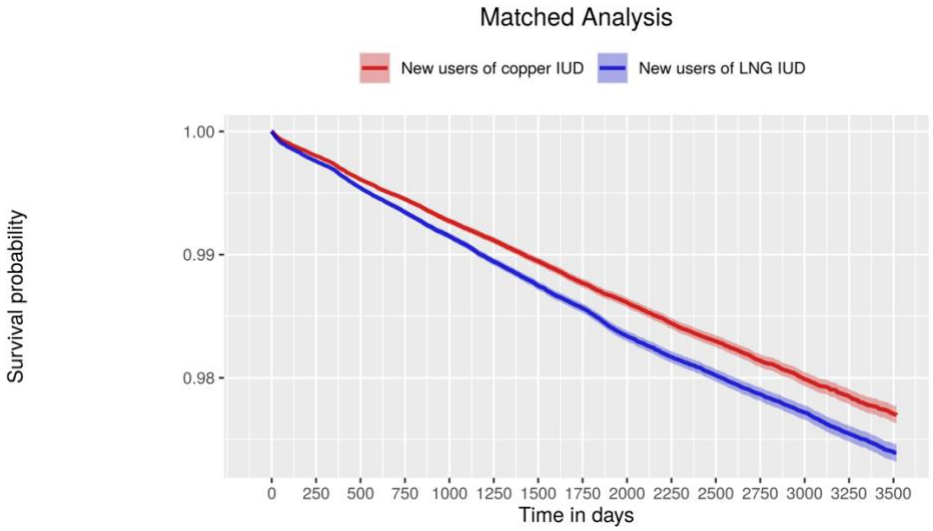

Figure 1: Fig. 4. Kaplan-Meier plot of high-grade cervical neoplasm–free survival compared with time (days) by intrauterine device (IUD) type as calculated by propensity score 1:1 matching. The Kaplan-Meier curves are shown with CI shading. The time at risk was from 30–3,530 days. Day 0 corresponds with 30 days after the index events. The number of patients at risk in each cohort as a function of time is shown below and parallel to the x-axis. Data Source: IQVIA Open Claims Database.

Discussion/Conclusion

The relative risk of cervical neoplasms for copper intrauterine device users was lower compared to levonorgestrel-releasing intrauterine device users in multiple claims databases. The consistency of results supports the validity of an association. Physiological studies may be needed to identify the mechanism of the reported relationship.

References

1. Spotnitz ME, Natarajan K, Ryan PB, Westhoff CL (2019). *Relative Risk of Cervical Neoplasms Among Copper and Levonorgestrel-Releasing Intrauterine Device Users.* Obstet Gynecol 135(2):319-327 (2020).