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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Abstract

The OHDSI community has presented evidence from a single database to suggest that Copper IUD (Cu IUD) exposure may decrease the risk of high grade cervical neoplasms relative to levonorgestrel-releasing intrauterine system (LNG-IUS) exposure [1]. We replicated the analysis on multiple claims databases of the OHDSI network.

Background

• Research suggests that women who had ever used an intrauterine device (IUD) had a lower risk of cervical cancer but studies comparing IUD types have not been studied widely.
• A prior study from Columbia University Irving Medical Center (CUIMC) found a lower relative risk of cervical neoplasms for Cu IUD relative to LNG-IUS users.
• The incidences of cervical neoplasms for Cu-IUD compared with LNG-IUS was 0.38 (95% CI 0.16-0.78, uncalibrated P <0.02). These results were similar to the reported incidences in a premarket randomized control trial conducted by Berlex Laboratories which was 0.4% absolute difference.
• This work aims to expand the analysis by conducting the analysis in various databases in 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

Table 1: Descriptive Statistics of the Target and Comparator Cohorts Before and After 1:1 Propensity Score Matching From 2003 to 2019 in the IQVIA Open Claims Database. Cu IUD, copper intrauterine device; LNG-IUS, levonorgestrel-releasing intrauterine system; HPV = Human Papillomavirus; IUD = Intrauterine Device.

- 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.

Table 2: Inferential Statistics of the Target and Comparator Cohorts After 1:1 Propensity Score Matching From 2003 to 2019 in the IQVIA Open Claims Database, IBM MarketScan Commercial Claims & Encounters (CCAE) and MarketScan Medicaid Multi-state (MDCD) Databases. Cu IUD, copper intrauterine device; LNG-IUS, levonorgestrel-releasing intrauterine system; 1K = 1,000; P-Y: Person-Years; 95% CI, 95% Confidence Interval; RR, Relative Risk; P, P-Value.

Conclusions

• 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 among several databases supports the validity of an association.
• Physiological studies may be needed to identify the mechanism of the reported relationship.

Reference:

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